IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

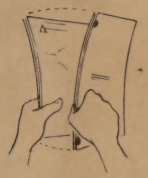
to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

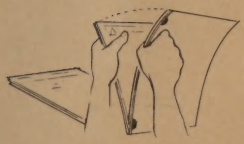
1

Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top, firmly.



2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.



3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

The PHOTOFACT® Servicer

SET 506 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ NOV. 1960

CONTENTS PHOTOFACT SET 506

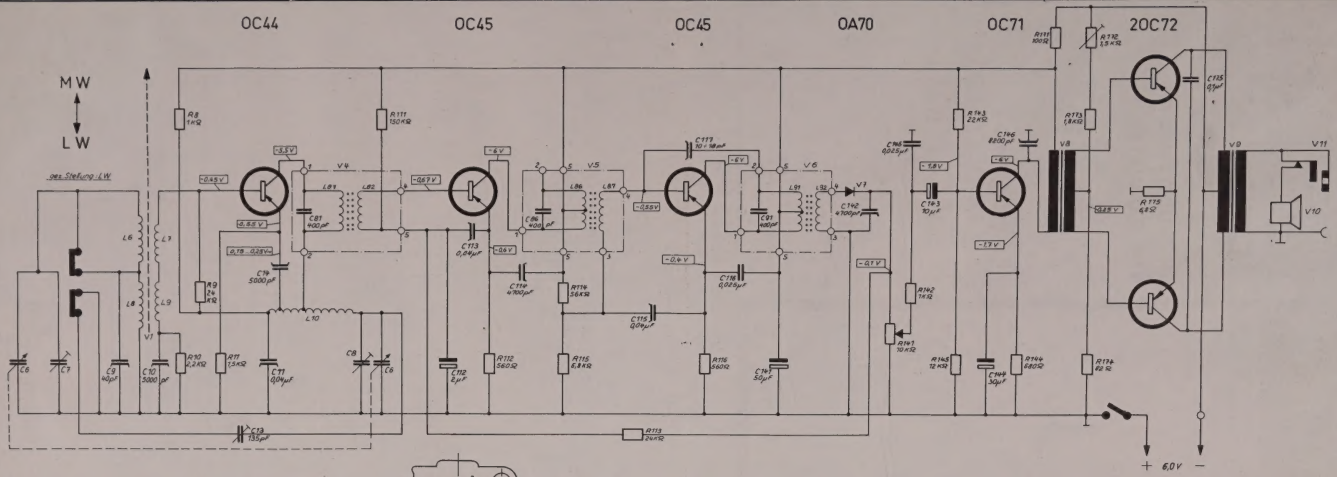
TRADE NAME AND MODEL	SET AND FOLDER NO.
TELEVISION RECEIVERS	
ADMIRAL Chassis 7E2, 15E1, 15E1B, 15F1, 15UE1	506-1
TRAV-LER 23K6075, 23MT6059 (Ch. 1051-60)	506-2
PRODUCTION CHANGE BULLETIN 247	
EMERSON 907B, 926B (Ch. 120478B, 120505B) (Phono)	506-3
PHILCO RC40 (TV Remote Control)	506-3
PHILCO T60, T62 (Transistor Radio)	506-3
PHILCO T-1000 (Transistor Radio)	506-3
OTHER EQUIPMENT	
ADMIRAL 925, 929, 938 (Ch. 2E1, 2E1A)	506-4
ARKAY ST-11	506-5
ARVIN 60R47, 60R49 (Ch. 1.50401)	506-6
BLAUPUNKT 3598	506-7
CAPITOL 935	506-8
COLUMBIA C1164B, M, W	506-9
CORONADO RA48-8257A, B	506-10
CURTIS MATHES 2014A, 2214A, 2414A (Ch. 14A)	506-11
GLASER-STEERS GS-400 (Record Changer)	506-12
MAGNAVOX AM-23	506-13
MOPAR 302	506-14
MOTOROLA 601X	506-15
NORELCO L3X88T	506-16
RCA VICTOR SES2LE (Ch. RS-185)	506-17
STEELMAN 201, 202, 403	506-18
551	506-19
TOSHIBA 6TP-354	506-20

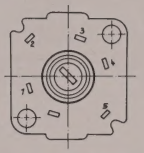
This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

IN THIS ISSUE OF THE SERVICER:

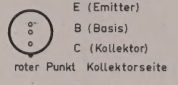
GMC Model
2233297

Nordmende Model
0/602 (Minibox)





Filter-Grundplatte
von unten gesehen



Transistoren- Anschlüsse

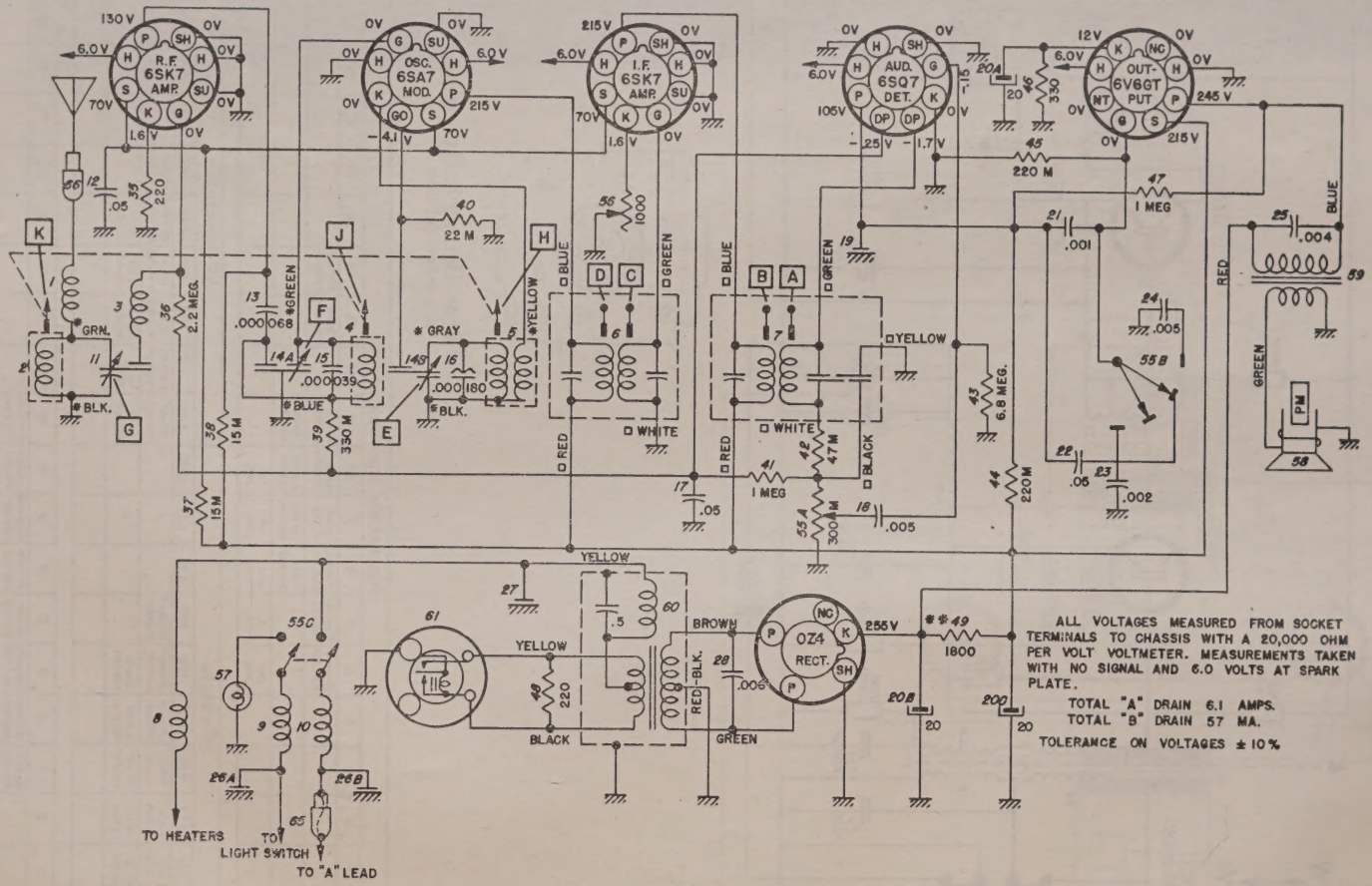
	Mischstufe und Spulensatz																			Bandfilter I			Bandfilter II			Bandfilter III		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	81	82	83	86	87	88	91	92	93
C						Drehko 4-146,5pF		Trimmer 4-46,5pF	Trimmer 4-46,5pF	90 µF MP 350 V-	3000 pF MP 350 V-	0,04 µF MP 350 V-		1330 pF KR 2500 V-	3000 pF MP 350 V-						400 pF MP 1250 V-			400 pF MP 1250 V-			480 pF KP 1250 V-		
R									7 kΩ 400..930	2,2 kΩ 400..936	2,2 kΩ 0,25 W	1,5 kΩ 400..937																	
L						108 Mzg		8 Mzg	240 mzg	18 mzg	140 mzg										104 mzg		15 mzg	104 kzg		15 mzg	104 mzg		36 mzg

	ZF-Stufe										NF-Vorstufe										NF-Gegentaktendstufe								
	111	112	113	114	115	116	117	118	119	120	141	142	143	144	145	146	147	148	149	150	171	172	173	174	175	176	176	177	178
C		2 µF 4+3,5V	0,04µF MP 350 V-	4700 µF KR 250 V-	0,04µF MP 350 V-	0,025µF KR 250 V-	10+10µF KR 350 V-				50 µF 4+6,4V	4700 pF KR 250 V-	70 µF KR 6,4V	30 µF KR 6,4V	0,025 µF KR 250 V-	8200 pF KR 250 V-								0,1 µF KR 250 V-				
R	130 kΩ 400..936	360 Ω 400..920	24 kΩ 400..936	56 kΩ 400..937	6,8 kΩ 400..933	560 Ω 400..920					10 kΩ 4+2,2 Ω	1 kΩ 400..930	22 kΩ 400..935	680 Ω 400..921	12 kΩ 400..934						100 Ω 0,33 W	1,5 kΩ 400..784	1,8 kΩ 400..932	82 Ω 0,33 W	4,8 Ω 0,33 W				
L																													

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
V	Ferrit. 4+8,2Ω			Bandf. 320..941	Bandf. 520..942	Bandfl. 520..943	Diode 944.021		Tr. Trete 322.021	Ausg. Trafo 922.042	Lautspr. 410.049	Um-Buch 174.038																	

NORDMENDE MODEL 0/602 (MINIBOX)

Schematic Diagram Courtesy of Nordmende: Importer Sterling Hi-Fidelity, Inc.


R.F. 6SK7 AMP.
OSC. 6SA7 MOD.
I.F. 6SK7 AMP.
AUD. 6SQ7 DET.
OUT-PUT 6V6GT
0Z4 RECT.
ALL VOLTAGES MEASURED FROM SOCKET TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT VOLTMETER. MEASUREMENTS TAKEN WITH NO SIGNAL AND 6.0 VOLTS AT SPARK PLATE.
TOTAL "A" DRAIN 6.1 AMPS.
TOTAL "B" DRAIN 57 MA.
TOLERANCE ON VOLTAGES ± 10%
TO HEATERS
TO LIGHT SWITCH
TO "A" LEAD

GMC MODEL 2233297

Schematic Diagram Courtesy of Delco Radio Div., General Motors Corp.

PHOTOFACT® Folder with CIRCUITRACE®

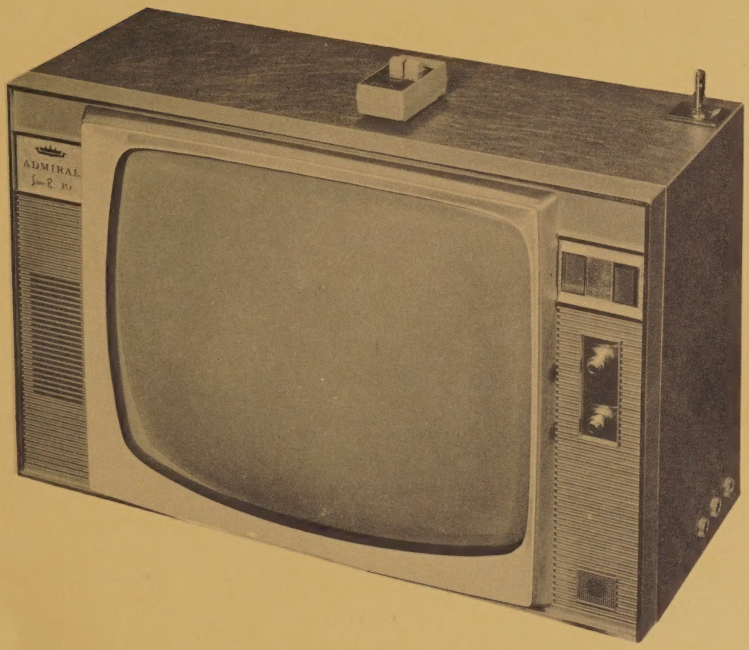
ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15UE1

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15UE1



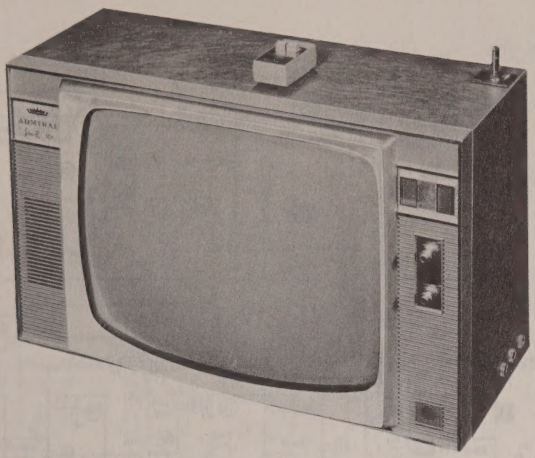
ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15UE1

MODEL PS19J171 (CH. 7E2, 15F1)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 506 FOLDER 1



MODEL PS19J171 (CH. 7E2, 15F1)

TRADE NAME	ADMIRAL	MODELS	CHASSIS
		C19J122, B, C19J123, B, C19J139, B, P19J150, B, P19J151, B, P19J155, B	15E1, B
		PS19J160, PS19J162, PS19J163, PS19J171, PS19J179	15F1
		(With Remote Control Receiver)	7E2
		C19UJ122, C19UJ123, C19UJ139, P19UJ150, P19UJ151, P19UJ155	15UE1
MANUFACTURER	Admiral Sales Corp., Service Division, 903 Morrissey Drive, P.O. Box 845, Bloomington, Illinois		
TYPE SET	Television Receiver (Models using TV Chassis 15F1 with Remote Control)		
TUBES	TV: VHF - Fifteen, UHF - Sixteen		
TRANSISTORS	Remote Control Receiver: Seven		
POWER SUPPLY	110-120 Volts AC, 60 Cycle		
RATING	200 Watts, 1.9 Amp. @ 117 Volts AC (With Remote Control Receiver, While Tuning)		
	181 Watts, 1.56 Amp. @ 117 Volts AC (With Remote Control Receiver, Not Tuning)		
	180 Watts, 1.55 Amp. @ 117 Volts AC (TV Only)		
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

It is necessary to remove cabinet and picture tube for safety glass removal and cleaning. (See "Picture Tube Removal" and "Cabinet Removal" page 20).

FUSE

A fuse wire is used for filament protection. (For location, see M2, "TV Chassis - Bottom View".)

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENT

To touch up VHF Oscillator, remove Station Selector Button Panel.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet - Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Coarse adjustment of the Horizontal Hold is accomplished by the proper setting of the Horizontal Lock Coil Slug. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

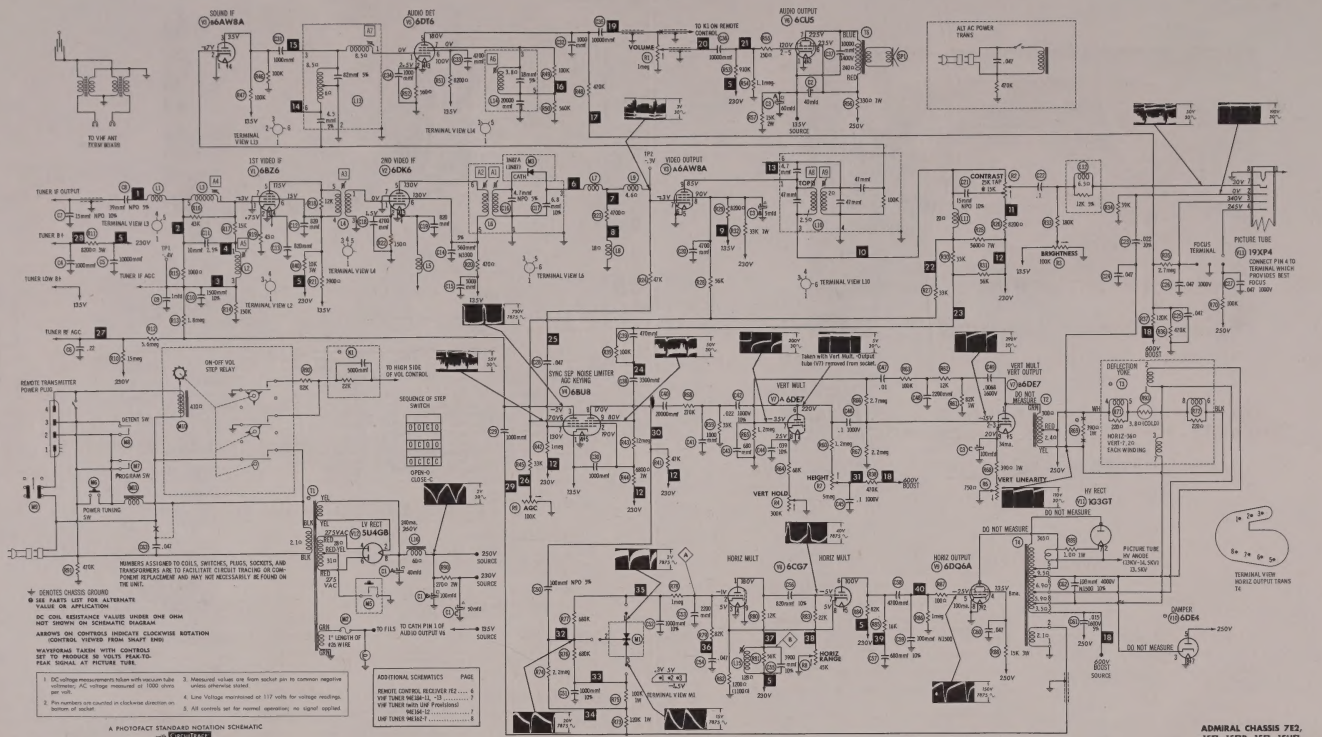
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

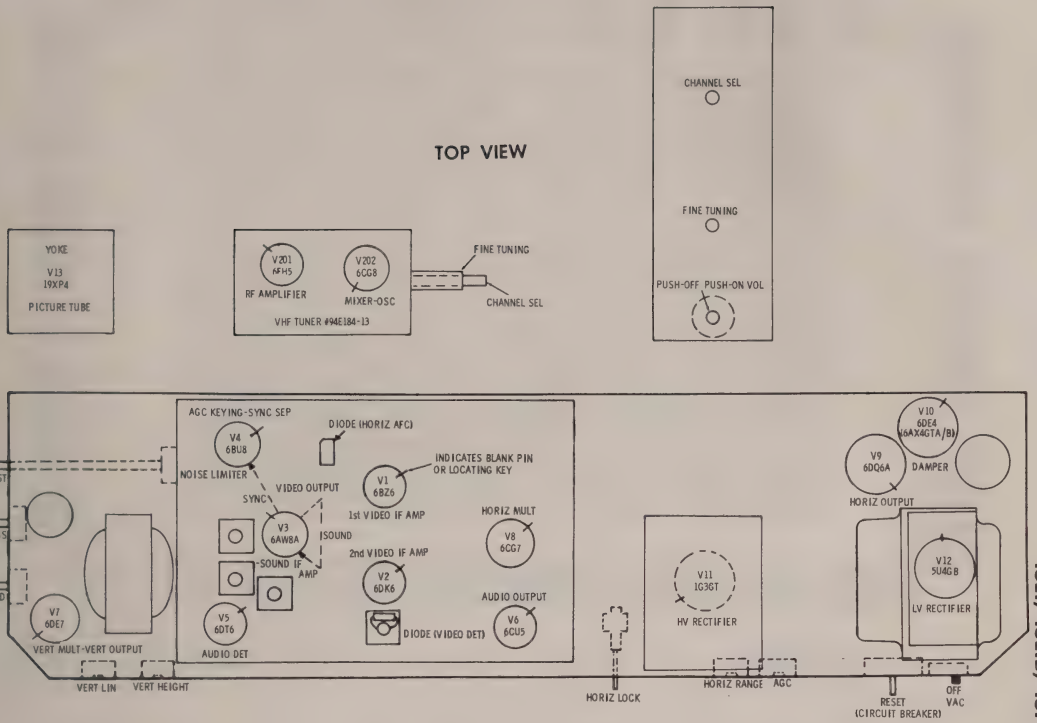
KA323

ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15UE1

SET 506 FOLDER 1


ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15U1
FOLDER 1
ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15U1
SOUND IF V6 6AW8A
AUDIO DET V5 6DT6
AUDIO OUTPUT V4 6CU5
1ST VIDEO IF V1 6BZ6
2ND VIDEO IF V2 6DK6
VIDEO OUTPUT V3 A6AW8A
VERT MULT V7 6DE7
VERT OUTPUT V8 6DE7
HORIZ MULT V9 6CG7
HORIZ MULT V10
HORIZ OUTPUT V11 6DQ6A
HV RECT V12 1G3GT
LV RECT V13 5U4GB
DAMPER V14 6DE4
PICTURE TUBE V15 19XP4
SYNC SEP NOISE LIMITER AGC KEYING V16 6BU8
VOLUME
CONTRAST
BRIGHTNESS
TONE
HEIGHT
VERT HOLD
VERT LINEARITY
HORIZ HOLD
HORIZ RANGE
FOCUS
DEFLECTION YOKE
PICTURE TUBE HV ANODE
TERMINAL VIEW HORIZ OUTPUT TRANS T4
TERMINAL VIEW V4
TERMINAL VIEW V16
TERMINAL VIEW L2
TERMINAL VIEW L3
TERMINAL VIEW L4
TERMINAL VIEW L6
TERMINAL VIEW L10
TERMINAL VIEW L14
TERMINAL VIEW L15
TO VHF ANT TERM BOARD
TO KI ON REMOTE CONTROL
ALT AC POWER TRANS
TUNER RF OUTPUT
TUNER B+
TUNER LOW B+
TUNER AGC
TUNER RF AGC
REMOTE TRANSMITTER POWER PLUG
ON-OFF VOL STEP RELAY
TO HIGH SIDE OF VOL CONTROL
SEQUENCE OF STEP SWITCH
DETENT SW
PROGRAM SW
POWER TUNING SW
AGC
TO FILS
TO CATH PIN 1 OF AUDIO OUTPUT V4
1" LENGTH OF #26 WIRE
250V SOURCE
230V SOURCE
135V SOURCE
600V BOOST
DO NOT MEASURE
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
ADDITIONAL SCHEMATICS PAGE
REMOTE CONTROL RECEIVER 7E2 6
VHF TUNER 9K58-11, -13 7
VHF TUNER with UHF Provisions 9K164-12 7
UHF TUNER 9K163-7 8
A PHOTOFACT STANDARD NOTATION SCHEMATIC
with SERVICEMAN
© Howard W. Sams & Co., Inc. 1960

TUBE PLACEMENT CHART



ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15UE1

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

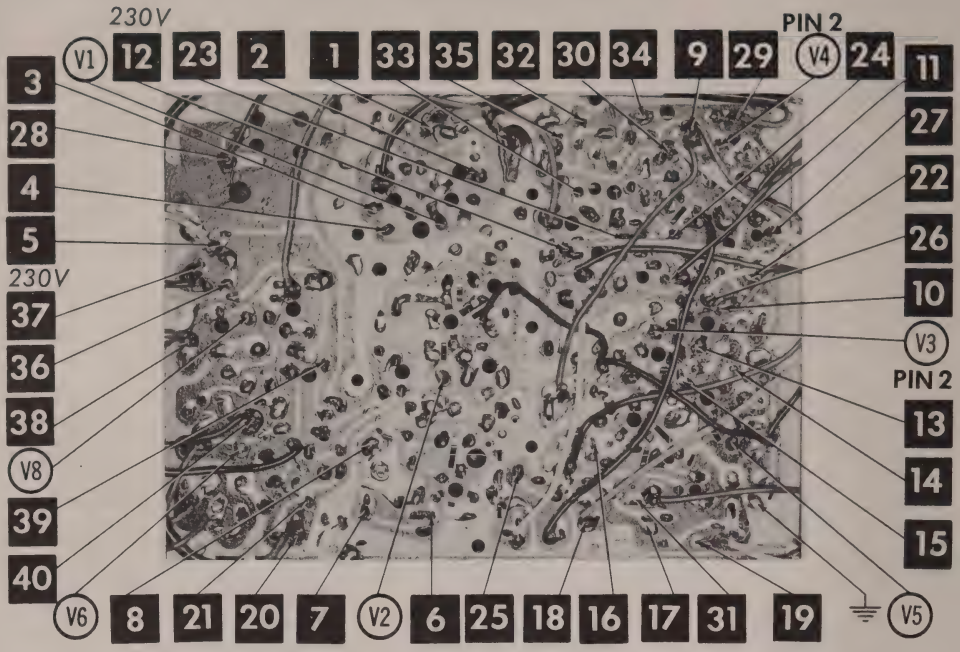
POWER SUPPLY FAILURE
No raster, no sound Circuit Breaker, V12

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V13
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture V8, V9, V10, V12
Vert. off freq. V7
Horiz. off freq. Diode (Horiz. AFC), V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V13
Has pic, no sound V3, V5, V6
Overloaded picture V4

SYNC FAILURE
No vert. sync V4
No horiz. sync V4
No vert. or horiz. sync V4

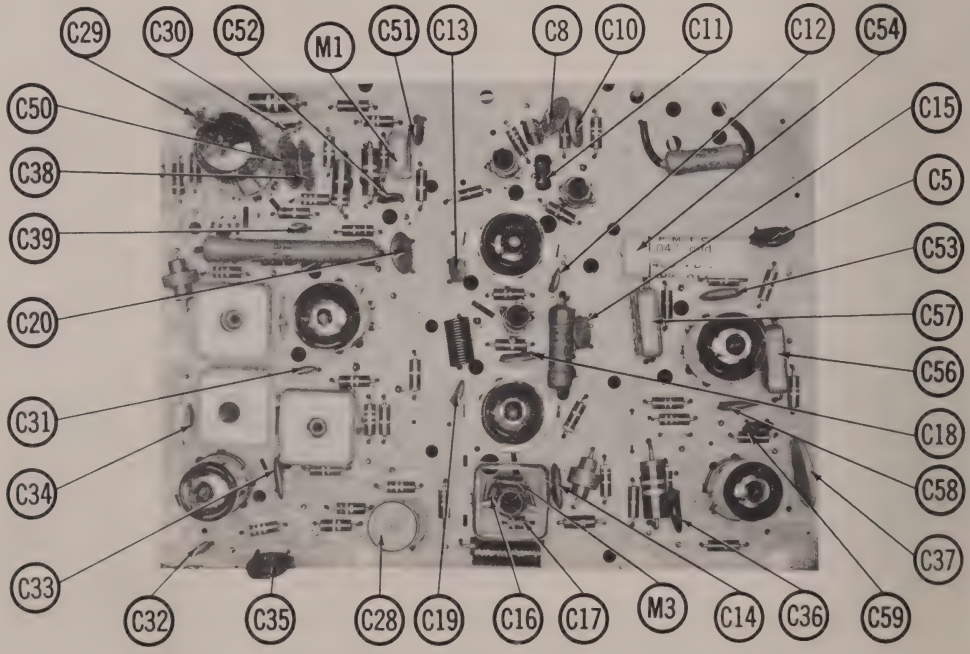
FOLDER 1



A Howard W. Sams CIRCUITRACE* Photo

TV PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



TV PRINTED BOARD - CAPACITOR & MISC. IDENT.

TV ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage Lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a variable bias supply to TP1. Positive to chassis.
Adjust to obtain response curve which shows no indication of overload.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough generator output to provide a usable indication.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side to ungrounded tube shield floating over Mixer-Osc. Low side to chassis.	Not Used	44.2MC (Unmod.)	Any non-interfering channel	Use VTVM DC probe thru 47K to TP2. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	42.7MC	"	"	A2	"
3.	"	"	44.3MC	"	"	A3	"
4.	"	"	43.3MC	"	"	A4	"
5.	"	"	44.8MC	"	"	Mixer Plate Coil	"
6.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection.
7.	"	44.0MC (10MC Swp.)	42.25MC 45.75MC	"	Vert. Amp. thru 47K to TP2. Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1 thru A4 and Mixer Plate Coil for desired response.

SOUND IF ALIGNMENT

Tune in a strong TV signal. Adjust controls for normal operation. Turn A6 slowly clockwise until a buzz is heard in the sound. Turn counterclockwise for maximum undistorted sound. Reduce the signal at the antenna terminals (by use of an adjustable attenuator or by disconnecting the antenna) until a strong hiss is heard in the sound. Carefully adjust A7 for maximum undistorted sound and MINIMUM hiss. If the hiss disappears during alignment, further reduce the signal until the hiss returns and adjust A7.
Carefully adjust A8 for MINIMUM 4.5MC beat interference in the picture.
Carefully adjust A9 for maximum undistorted sound with MINIMUM hiss. If the hiss disappears, reduce the signal until the hiss returns and retouch A9.

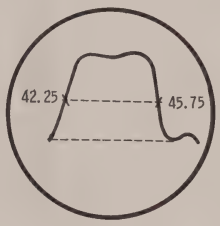


FIG.1

TUNER ALIGNMENT INSTRUCTIONS PAGE 13

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

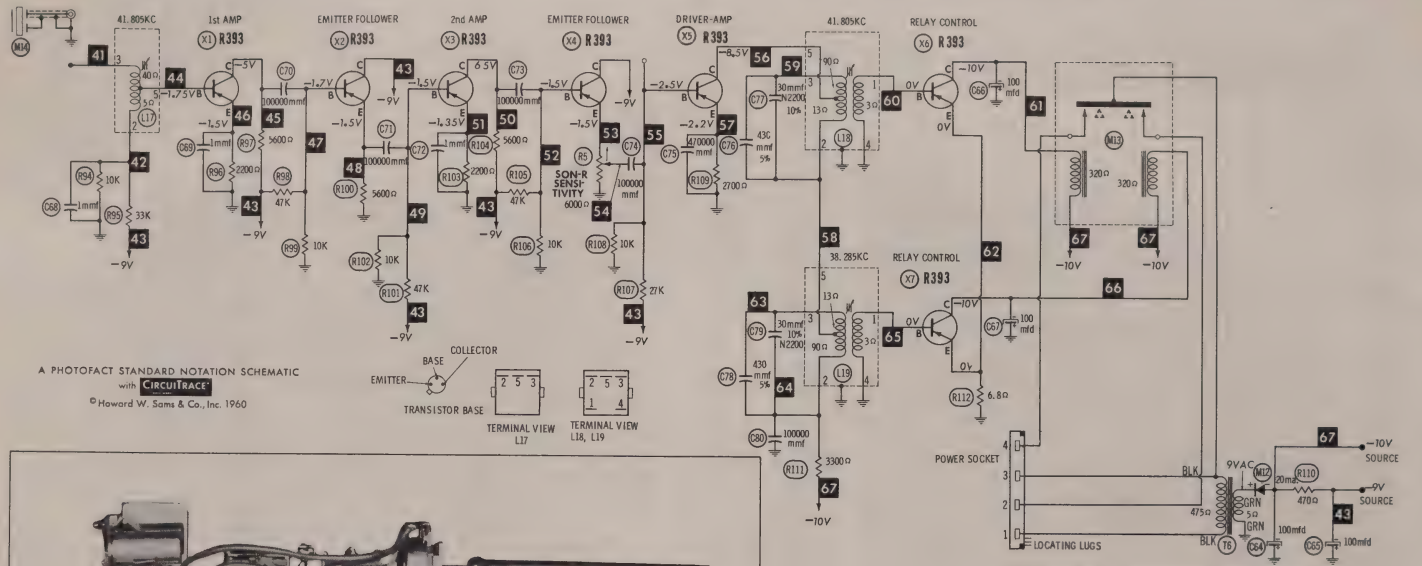
Turn the set on and tune in a TV signal, preferably with a test pattern.

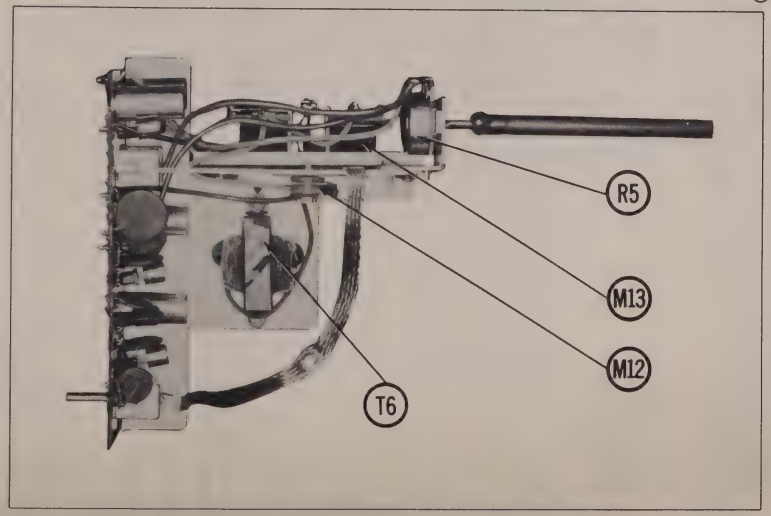
Short out the AFC voltage by connecting a clip lead from point (A) to chassis. Connect a .22mfd, 400 volt capacitor from point (B) to chassis.

Adjust the Horizontal Range to point where picture is almost stable horizontally.

Remove the capacitor from point (B) and adjust the Horizontal Lock to the point where the picture is almost stable.

Remove the clip lead from point (A) and chassis. Adjust the Horizontal Lock until the picture is synchronized horizontally.





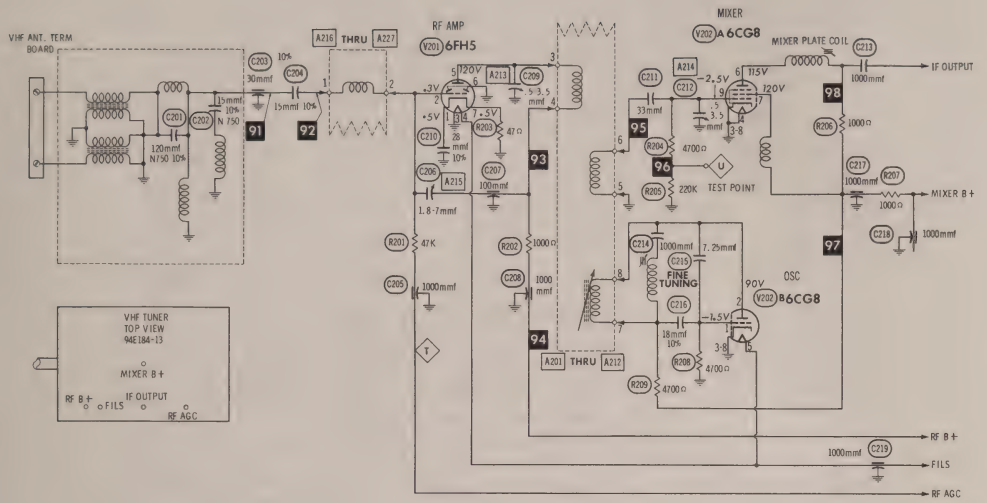
RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	R393	8000Ω	2200Ω	††6000Ω
X3	R393	10K	2200Ω	††6000Ω

TRANSISTORS X1 AND X3 REMOVED FOR RESISTANCE MEASUREMENTS. RESISTANCE MEASUREMENTS FOR X2, X4, X5, X6 AND X7 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
†† MEASURED FROM OUTPUT OF M12.

ALL TRANSISTOR MEASUREMENTS MADE WITH NO SIGNAL AND SON-R DISTANCE SELECTOR TURNED TO MAXIMUM COUNTERCLOCKWISE POSITION, AND WITH RELATION TO COMMON POSITIVE.

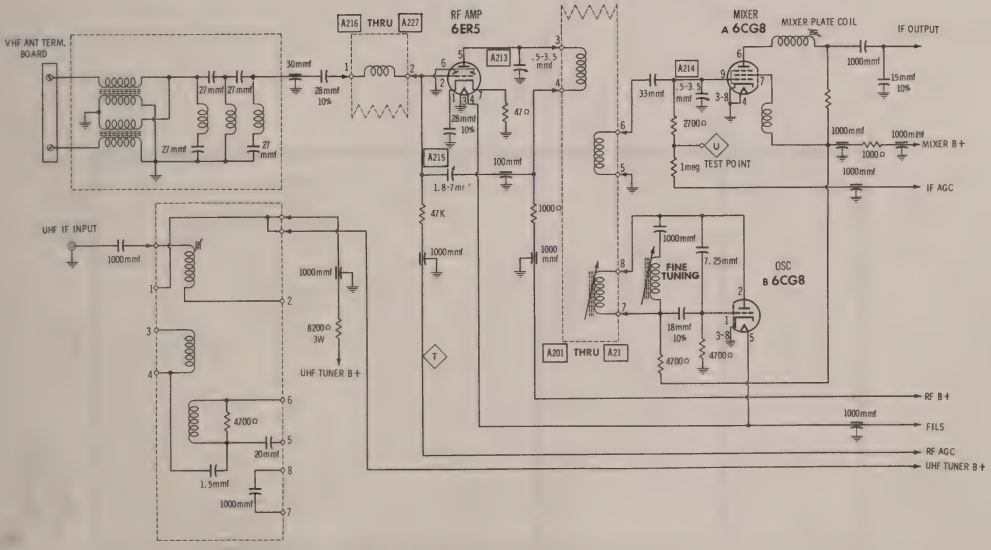
REMOTE CONTROL RECEIVER 7E2



A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

© Howard W. Sams & Co., Inc. 1960

VHF TUNER 94E184-11, 94E184-13



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960

VHF TUNER with UHF Provisions 94E164-12

TUNER PARTS LIST AND DESCRIPTIONS 94E184–13

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amp.	6FH5	V202	Mixer - Osc.	6CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N750 10%		N750-DI 120	TCN-120	C10T12U	CCTN-121	CN7-312	10TCU-T12
C202	15 N750 10%		N750-DI 15	DTN-15	C10Q15U	CCTN-150	CN7-415	10TCU-Q15
C203	30 10%							
C204	15 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C205	1000		EF-001	MFT-1000		CCF-102	CT280A	
C206	1.8-7			829-7				
C207	100		EF-0001	MFT-100				
C208	1000		EF-001	MFT-1000		CCF-102	CT280A	
C209	.5-3.5							
C210	28 10%		DI-270	DD-270	L10Q27	CCD-270	GP427	10TS-Q27
C211	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C212	.5-3.5							
C213	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C214	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C215	7.25				C10V7C			
C216	18 10%		DI-18	DD-180	L10Q18	CCD-180	GP418	10TS-Q18
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	47K	
R202	1000Ω	
R203	47Ω	

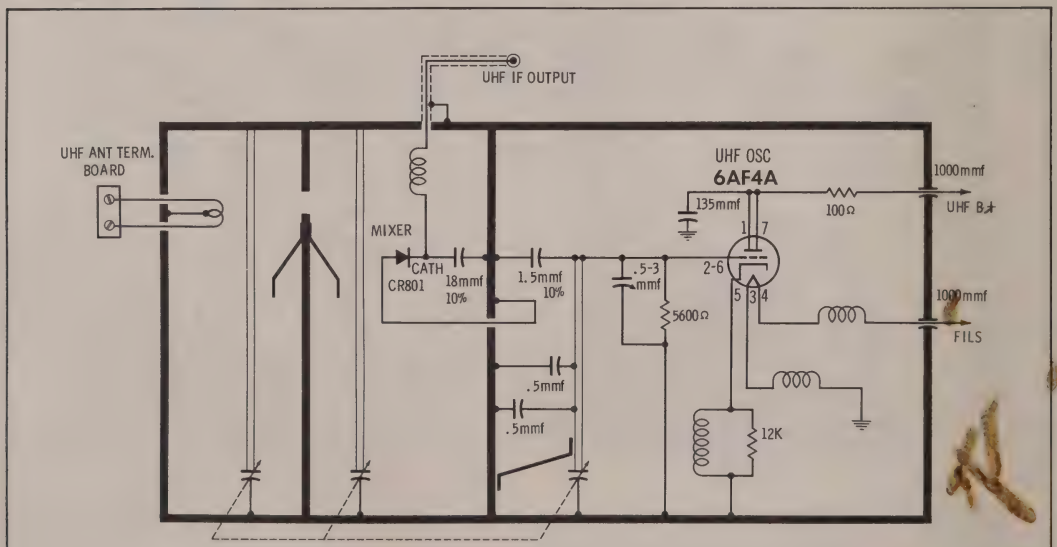
ITEM No.	RATING	REMARKS
R204	4700Ω	
R205	220K	
R206	1000Ω	

ITEM No.	RATING	REMARKS
R207	1000Ω	
R208	4700Ω	
R209	4700Ω	

COILS (RF-IF)

ITEM No.	USE	ADMIRAL PART No.	NOTES
L201A	Ant., RF, Mixer & Osc. Coils	94E184-52	Channel 2
B	"	94E184-53	Channel 3
C	"	94E184-54	Channel 4
D	"	94E184-55	Channel 5
E	"	94E184-56	Channel 6
F	"	94E184-57	Channel 7
G	"	94E184-58	Channel 8

ITEM No.	USE	ADMIRAL PART No.	NOTES
L201H	Ant., RF, Mixer & Osc. Coils	94E184-59	Channel 9
I	"	94E184-60	Channel 10
J	"	94E184-61	Channel 11
K	"	94E184-62	Channel 12
L	"	94E184-63	Channel 13
L202	Ant. Trans.	700B169	



A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

UHF TUNER 94E162–7

TV PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	1st Video IF Amp.	6BZ6	V6	Audio Output	6CU5
V2	2nd Video IF Amp.	6DK6	V7	Vert. Mult. - Vert. Output	6DE7
V3	Video Output - Sound IF Amp.	6AW8A	V8	Horiz. Mult.	6CG7
V4	AGC Keying - Sync Sep. - Noise Limiter	6BU8	V9	Horiz. Output	6DQ6A
V5	Audio Det.	6DT6	V10	Damper	6DE4 (6AX4GTA/B)*
			V11	HV Rectifier	1G3GT
			V12	LV Rectifier	5U4GB

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA					NOTES
	ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V13	19XP4		19XP4 ①		19XP4 ②	① Aluminized ② Silver Screen "85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲40	350	67D15-343	AFH3-29-50	C0236	FP420.39	TMT-3441	TVLS-3647 *	
B	■100	350							
C	▲50	350							
C2	40	200	67B4-21	PRSI580	BR4025	TC58	TD-40-250	TVA-1511	
C3A	■60	200	67D15-332	AFH3-84-60	B0576	WP319.6	TMD-2280	TVL-2561	
B	▲5	200			BR835		TD-100-50	TVA-1310	
C	100	50							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING			REMARKS	REPLACEMENT DATA					
					AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	1000			Note 1	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	10000			Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.22	200V			P288N-22		CUB2P22	2DP-3-224	GEM-2022	2TM-P22
C7	15	NPO	10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C8	39	NPO	5%	Note 1		TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C9	1mfd	100V			P288N-1.0		CUB2W1	1DP-5-105	GEM-21	2TM-M1
C10	1500		10%		DI-1500	DD-152	PM6D15	CCD-152	GP215	10TS-D15
C11	10		2.5%		NPO-SI 10	TCZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C12	820				DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C13	820				DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C14	560	N3300	5%	Pt. #65D10-159						
C15	5000			Note 1	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C16	4.7	NPO	5%		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C17	6.8		10%		NPO-SI 6.8	TCZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C18	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C19	820				DI-820	DD-821	BYA10T82	CCD-821	B-382	10TS-T82
C20	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C21	15	NPO	10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C22	.1	400V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C23	.022	600V	10%		V84C6S22-10%		PM6S22	6DP-2-223	GEM-1612	6TM-S22
C24	.047	600V			P688N-047	DD-503	CUB4S47	6DP-3-473	GEM-6147	6TM-S47
C25	.047	600V			P688N-047	DD-503	CUB4S47	6DP-3-473	GEM-6147	6TM-S47
C26	.047	1000V			P1088N-047		CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C27	.047	1000V			P1088N-047		CUB10S47	16DP-5-473	GEM-10147	10TM-S47
C28	.047	400V		Pt. #64C16-30						
C29	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C30	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C31	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C32	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C33	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C34	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C35	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	10000				BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C37	10000	1400V			DAC-27	DDI6-103	HVE16S1	16DP-3-103	UAC-110	BL-S10
C38	3300				BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C39	470				BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C40	20000				BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C41	1000				BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C42	.022	1000V	10%		P1084CM-022		DPMSI6S22	16DP-5-223	GEM-1612	10TM-S22
C43	680				BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C44	.039	600V	10%	Pt. #64C26-25						
C45	.1	1000V			P1088N-1		CUB10P1		GEM-1001	10TM-P10
C46	.1	1000V			P1088N-1		CUB10P1		GEM-1001	10TM-P10
C47	.01	600V			P688N-1	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S10
C48	2200				BPD-0022	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C49	.0068	1600V			P1684CM-0068	DDI6-702	CUB16D68	16DP-3-702	GEM-16268	MB-D68
C50	100	NPO	5%			DTZ-100	C10T1C		CNO-310	10TCC-T10
C51	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C52	1000		10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C53	2200				BPD-0022	DD-222	BYA10D22	CCD-2200	B-222	5HK-D22
C54	.047	400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C55	3900		10%		1464-0039		1R5D39	CM-20B-392K	MCJ462.5	MS-239
C56	820		10%		1469-00082		5R5T82	CM-19B-821K	MCB4S1	MS-382
C57	680		10%		1469-00068		5R5T68	CM-19B-681K	MCJ249	MS-368
C58	4700				BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C59	100	N1500				TCL-100		*		
C60	.047	600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

TV PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: ARROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	FILAMENCO PART No	MALLORY PART No	SPRAGUE PART No
C81	.015 1600V 5%	Pt. #94B3-59						
C82	100 4000V MIMO 10%	Pt. 98D10-212						
C83	.047 800V	P688N-047	DD-503	CUB5847	EDF-3-472	GEM-6147	ETM-647	

Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING: RESIST. A/MΩ	WATTS	REPLACEMENT DATA: ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	75C75-1					Volume Note 1
B	Switch							Off-On Volume, Step Relay
R2	25K	½	75B70-1					Contrast
	15K Tap							
R3A	100K	½	75D20-153		A47-100K-8	BU-158	U41	Brightness
B	Shaft				R3-5/16	5K8	D8-37	
R4A	300K	½	75D20-153		A47-300K-8	BU-431	U48	Vert. Hold
B	Shaft				R3-5/16	5K8	D8-37	
R5A	600Ω	½	75D20-107			BU-415	BU831	Sen-R-Sensitivity Note 2
B	Bushing					Not Req.	8L-28	
C	Shaft					TM-4	8L-3500	
R6A	750Ω	½	75D20-134	TT-411	B47-750-8	BU-108	PTA75L	Vert. Linearity
B	Shaft			Not Req.	Not Req.	Not Req.	TM4	
R7	5meg	½	75D20-119	TT-47	B47-5meg-8	ELC8	PTA85L	Height
R8A	45K	½	75D20-131	TT-31	B47-50K-8	BU-138	PTA84L	Horiz. Range
B	Shaft			Not Req.	Not Req.	Not Req.	PTA15L	
R9A	100K	½	75D20-118	AB-36	B47-100K-8	BU7-138	PTA15L	AGC
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

Note 1. Chassis 15E1, B, 15U1B use 1meg with switch (Part #75B44-8). Note 2. Not used in Chassis 15E1, B, 15U1.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R10	15meg	
R11	4700Ω 5W	IRC #PW5-4700Ω
R13	5.6meg	
R13	1.8meg	
R14	150K	
R15	1000Ω	
R16	43K	
R17	18K	
R18	12K	
R19	43Ω	
R20	470Ω	
R21	2200Ω	
R23	150Ω	
R24	47000Ω	
R24	47K	
R25	56000Ω 7W	IRC #PW10-56000Ω
R26	68000Ω	
R27	33K	
R28	56K	
R29	82000Ω	
R30	33K	
R31	56K	
R33	33K 1W	
R33	180K	
R34	39K	
R35	3.3meg	
R36	470K	
R37	180K	

ITEM No.	RATING	REMARKS
R38	470K	
R39	100K	
R40	10K 2W	IRC #PW5-10000Ω
R41	47K	
R42	1meg	
R43	12meg	
R44	68000Ω 1W	
R46	33K	
R46	100K	
R47	100K	
R48	470K	
R49	100K	
R50	560K	
R51	82000Ω	
R52	5600Ω	
R53	910K	
R54	1.1meg	
R55	150Ω	
R56	3300Ω 1W	
R57	15K 2W	
R58	270K	
R59	33K	
R60	1.2meg	
R61	82K 1W	
R62	12K	
R63	100K	
R64	68K	
R65	1.2meg	

ITEM No.	RATING	REMARKS
R66	2.7meg	
R67	3.3meg	
R68	3900 1W	
R69	3900 1W	Note 1
R70	100K	
R71	2200	(100Ω) *
R72	2200	(100Ω) *
R73	120K 1W	
R74	2.2meg	
R75	100K 1W	
R76	680K	
R77	680K	
R78	1meg	
R79	82K	
R80	56K	
R81	56K	
R82	12000	(100Ω) *
R83	22K	
R84	82K	
R85	15K	
R86	1meg	
R87	100Ω	
R88	18K 2W	IRC #PW5-18000Ω
R89	1.0Ω 1W	
R90	270Ω 2W	
R91	470K	
R92	82K	
R93	3.6Ω (Cold)	Pt. #6A37

Note 1. May not be used in some versions. * Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA
K1	Isolation	5000mmf, 22K *		

* Some versions may use 22K Resistor and .0047mfd Capacitor in this application.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Stancor PART No.	NOTES
L1	RF Choke *						* Not used in some versions
L2	4.5MC Trap	73C133-44					
L3	1st Video IF	73C133-45					
L4	2nd Video IF	73C133-43					
L5	41/2 Choke	73B37-3	BC-562	4604	VP-9	RTC-8516	1.4uh
L6	3rd Video IF	73B307-2					
L7	RF Choke	73B31-4	BC-566	4622		RTC-8533	13uh
L8	Shunt Peaking Coil	73C5-20	TV-186	8174	VP-8	RTC-8592	52buh
L9	RF Choke	73B31-3	TV-193	4638		RTC-8525	26uh
L10A	4.5MC Trap	73C186-2					
B	1st Sound IF						
L11	Shunt Peaking Coil	73C5-34	TV-208	8157		RTC-8569	

COILS (RF-IF) (cont)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Stancor PART No.	NOTES
L12	Series Peaking Coil	T3C5-40 ①	TV-197 ▲	8184 ▲	YP-5 ▲	RTC-8597 ▲	190uh
L13A	Phase Shift Coil	73B308-1					
B	2nd Sound IF						
L14	Quadrature Coil	73C133-37					

① Wound on 12K Resistor. ▲ Parallel with 12K Resistor.

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Miller PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L15	Horiz. Lock Coil (Stabilizer)	94DT-14						RS-16		

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE (@ CURRENT 1000 ~)	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L16	.240A	60Ω	1 Hy.	74C18-38			C-2343	26C44 ①	C-34X	

① Drill new mounting hole(s).

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ② 1.55A	560VCT @ .340A DC	6V ② 2A	80D73-3 ①	P-3883		P-8356		R-75BA	
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ② 8.5A									

① Alternate Part #80D73-1 used in Chassis 15E1, B, 15F1. Part #80D73-3 used in Chassis 15U1.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Rem PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	79C63-20		Y-209				A-160X
T3	Yoke Horiz. (17.8MH)	94ZE88-1 ①		Y-100 ③④			Y-52 ③④	Y-80-1
	114° Vert. (14.2MH)					UY-27A ③④		
	Adj. Yoke Rear Cover and Centering Device	94ZE88-3 ② 94C153-3						
	Horiz. Output	79D83-4						D-17LX ※

① Used in Models with R59 (330Ω) across T3 secondary. Recommended replacement Pt. #94C188-3. Remove R59.
② Used in Models without R59 across T3 secondary.
③ Use original yoke damping network if necessary.
④ Requires new rear cover and centering device.

※HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Rem Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5						5
6						6
7						YCT
8						7
3						8
2						3
1						1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: ADMIRAL PART No.	Merit PART No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4300Ω	3-4Ω	79D83-29	A-3038	AU-801 ①	A-3850 ①	34B48	S41Z	① Drill new mounting hole(s)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA: ADMIRAL PART No.	QUAM PART No.	NOTES
	SIZE	FIELD	V. C. IMP.			
SP1	2" x 8"	PM	3-4Ω	78C158-2	20A08	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		93B3-8 *	6GC1 *				* Dual Selenium Diode

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	1" Length of #26 Wire							

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: ADMIRAL PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M3	1N87A or 1N87		1N87A	1N87A	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Tuner	94ZE84-13	VHF, Used in Chassis 15F1, STANDARD COIL REPLACEMENT Type #GO-4320-A
	Tuner	94ZE84-11	VHF, Used in Chassis 15E1
	Tuner	94ZE84-12	VHF with UHF Provisions, Used in Chassis 15U1
	Tuner	94ZE82-7	UHF, Used in Chassis 15U1
	Antenna	89C345-2A	JFD REPLACEMENT Type PTA39U, Used in Models PR87U, 17D, PR84U50, D, 1D, D, 18D, D, PR82U50, D, 2D, D, 18D, D, PR84U50, 12D, 16D
M5	Circuit Breaker	94A17-1	
M6	Switch	77B104-1	Tuning, Pushbar
M7	Switch	77B107-1	Motor Disconnect
M8	Switch	94ZE84-1DY	Detent
M9	Switch	77B18-1	Remote Off-On (Slide DPDT)
M10	Relay	83C54-1	Off-On Volume (Includes 4 Position Cam Operated Switch)
M11	Tuner Motor and Gear Assembly	91D43-1	Replace with Original Type (Number stamped on back of gear box assembly). Includes Motor stator and coil (Part #91D43-61), Rotor (Part #91D43-52) and Gear Bus (Part #91D43-53).
	Tuner Motor and Gear Assembly	91D48-1	Replace with Original Type (Number stamped on rear of gear box assembly). Includes Motor stator and coil (Part #91D48-61), Rotor (Part #91D48-52) and Gear Bus (Part #91D48-53).

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8375
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8455 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

REMOTE CONTROL RECEIVER PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA: RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
X1	R393	1st Amp.	2N408			PNP
X2	R393	Emitter Follower	2N408			PNP
X3	R393	2nd Amp.	2N408			PNP
X4	R393	Emitter Follower	2N408			PNP
X5	R393	Driver - Amp.	2N408			PNP
X6	R393	Relay Control				PNP
X7	R393	Relay Control				PNP

ADMIRAL CHASSIS 7E2, 15E1, 15E1B, 15F1, 15U1

FOLDER 1

REMOTE CONTROL RECEIVER
PARTS LIST AND DESCRIPTIONS (Continued)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C64	100	15	67C47-1	BCD15100	ECPB417	TT15X100	ML100-15	VL-1180	
C65	100	15	67C47-1	BCD15100	ECPB417	TT15X100	ML100-15	VL-1180	
C66	100	15	67C47-1	BCD15100	ECPB417	TT15X100	ML100-15	VL-1180	
C67	100	15	67C47-1	BCD15100	ECPB417	TT15X100	ML100-15	VL-1180	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C68	1 3V			UK-105				HY-135
C69	1 3V			UK-105				HY-135
C70	100000 50V		C80V104AM	DDA-104	DPMS2P1	1DP-2-104	TA-010	TG-P10
C71	100000 50V		C80V104AM	DDA-104	DPMS2P1	1DP-2-104	TA-010	TG-P10
C72	1 3V			UK-105				HY-135
C73	100000 50V		C80V104AM	DDA-104	DPMS2P1	1DP-2-104	TA-010	TG-P10
C74	100000 50V		C80V104AM	DDA-104	DPMS2P1	1DP-2-104	TA-010	TG-P10
C75	470000 10V			UK-474	DPMS-P47			HY-339
C76	430 5%		1469-00043		5R5T43	CM-19B-431J *		MS-343
C77	30 N2200 10%	Pt. #65D10-189						
C78	430 5%		1469-00043		5R5T43	CM-19B-431J *		MS-343
C79	30 N2200 10%	Pt. #65D10-189						
C80	100000 50V		C80V104AM	DDA-104	DPMS2P1	1DP-2-104	TA-010	TG-P10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

SEE TV PARTS LIST FOR (R5) SON-R-SENSITIVITY CONTROL

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R94	10K	
R95	33K	
R96	2200Ω	
R97	5600Ω	
R98	47K	
R99	10K	
R100	5600Ω	

ITEM No.	RATING	REMARKS
R101	47K	
R102	10K	
R103	2200Ω	
R104	5600Ω	
R105	47K	
R106	10K	
R107	27K	

ITEM No.	RATING	REMARKS
R108	10K	
R109	2700Ω	
R110	470Ω	
R111	3300Ω	
R112	6.8Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA ADMIRAL PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	NOTES
L17	Input Coil	69C251-1					
L18	41.805KC Output	69C248-1					
L19	38.285KC Output	69C248-1					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA ADMIRAL PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T6	117V @ .010A	9V @ .020A DC		80B74-1						

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA ADMIRAL PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M12	.020A	93B24-1 *					* Selenium

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M13	Relay	83C33-1	Function Relay and Mechanical Discriminator
M14	Microphone	78B147-1	

VHF TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A213, A214, A215 ..... GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
		207MC	205.25MC 209.75MC	12		A202	
		201MC	199.25MC 203.75MC	11		A203	
		195MC	193.25MC 197.75MC	10		A204	
		189MC	187.25MC 191.75MC	9		A205	
		183MC	181.25MC 185.75MC	8		A206	
		177MC	175.25MC 179.75MC	7		A207	
		85MC	83.25MC 87.75MC	6		A208	
		79MC	77.25MC 81.75MC	5		A209	
		69MC	67.25MC 71.75MC	4		A210	
		63MC	61.25MC 65.75MC	3		A211	
		57MC	55.25MC 59.75MC	2		A212	

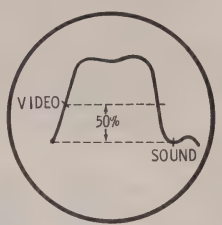


FIG. 201

RF AND MIXER ALIGNMENT

Connect the negative lead of a variable bias supply to point (T). Positive to chassis. Set bias for 2.5 volts.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point (1). Common to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope.
3.	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns.
		207MC	205.25MC 209.75MC	12		A217	
		201MC	199.25MC 203.75MC	11		A218	
		195MC	193.25MC 197.75MC	10		A219	
		189MC	187.25MC 191.75MC	9		A220	
		183MC	181.25MC 185.75MC	8		A221	
		177MC	175.25MC 179.75MC	7		A222	
		85MC	83.25MC 87.75MC	6		A223	
		79MC	77.25MC 81.75MC	5		A224	
		69MC	67.25MC 71.75MC	4		A225	
		63MC	61.25MC 65.75MC	3		A226	
		57MC	55.25MC 59.75MC	2		A227	

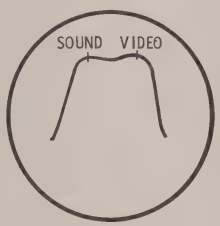
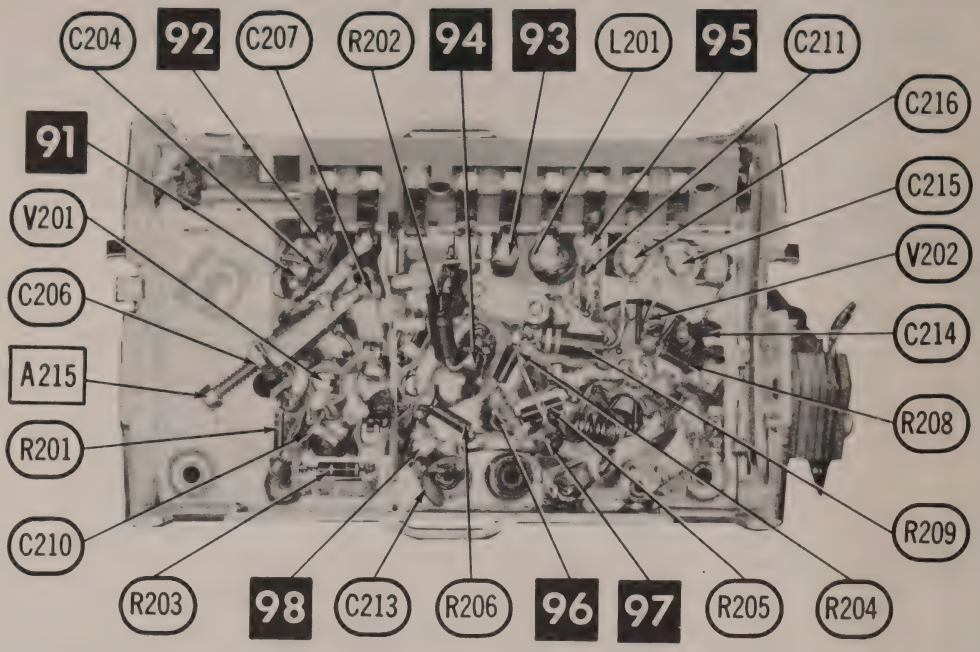


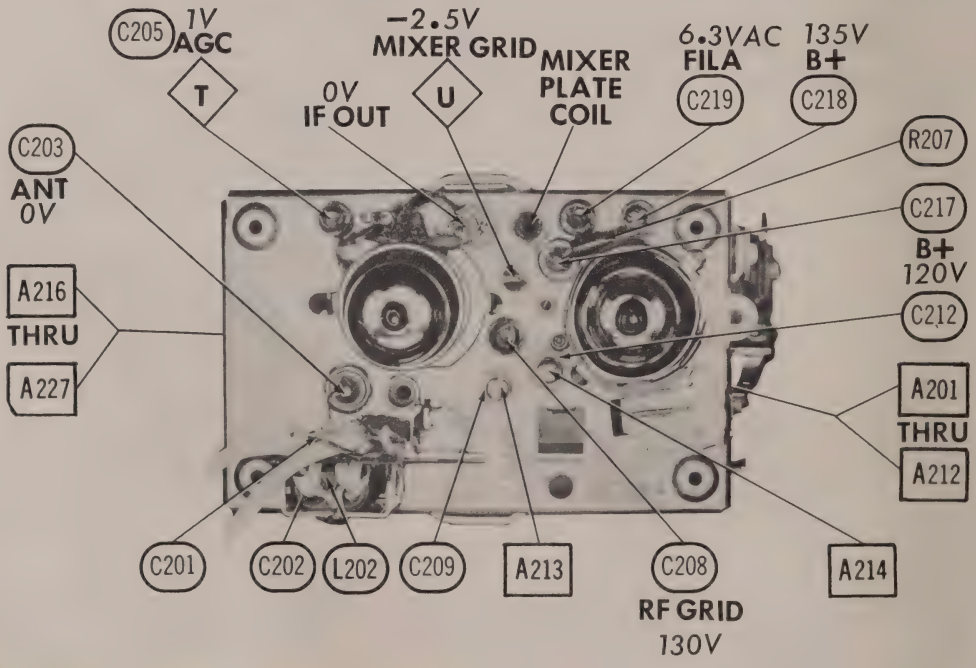
FIG. 202



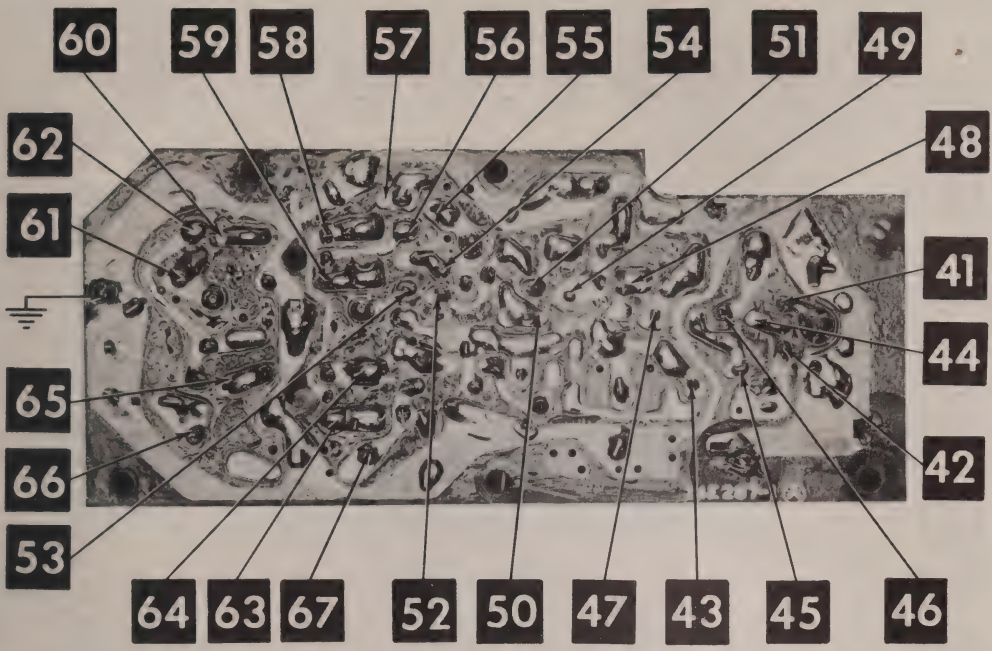
A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

VHF TUNER 94E184-13 - BOTTOM VIEW

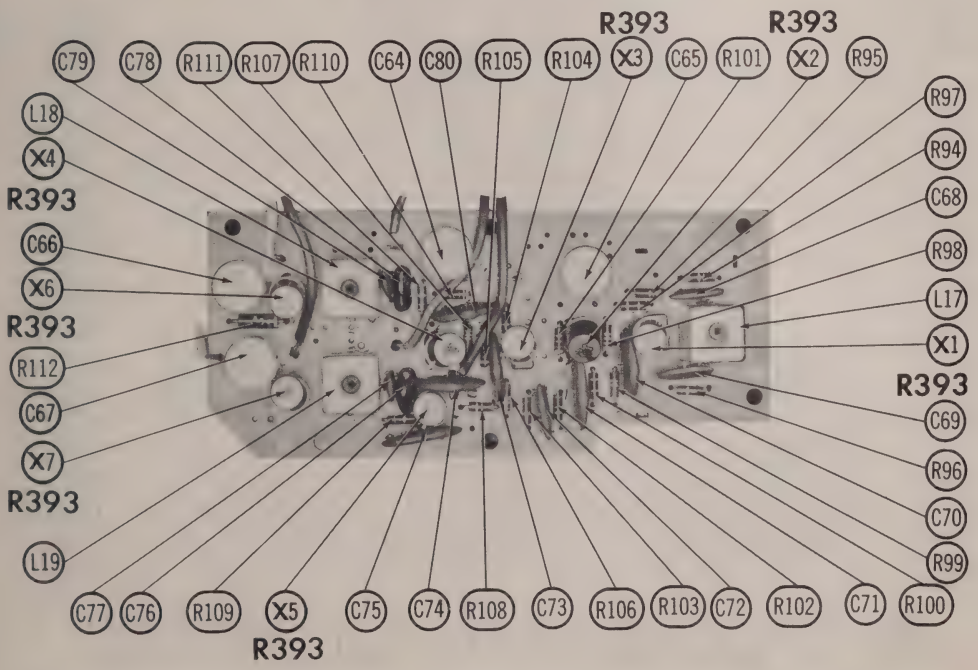


VHF TUNER 94E184-13 - TOP VIEW

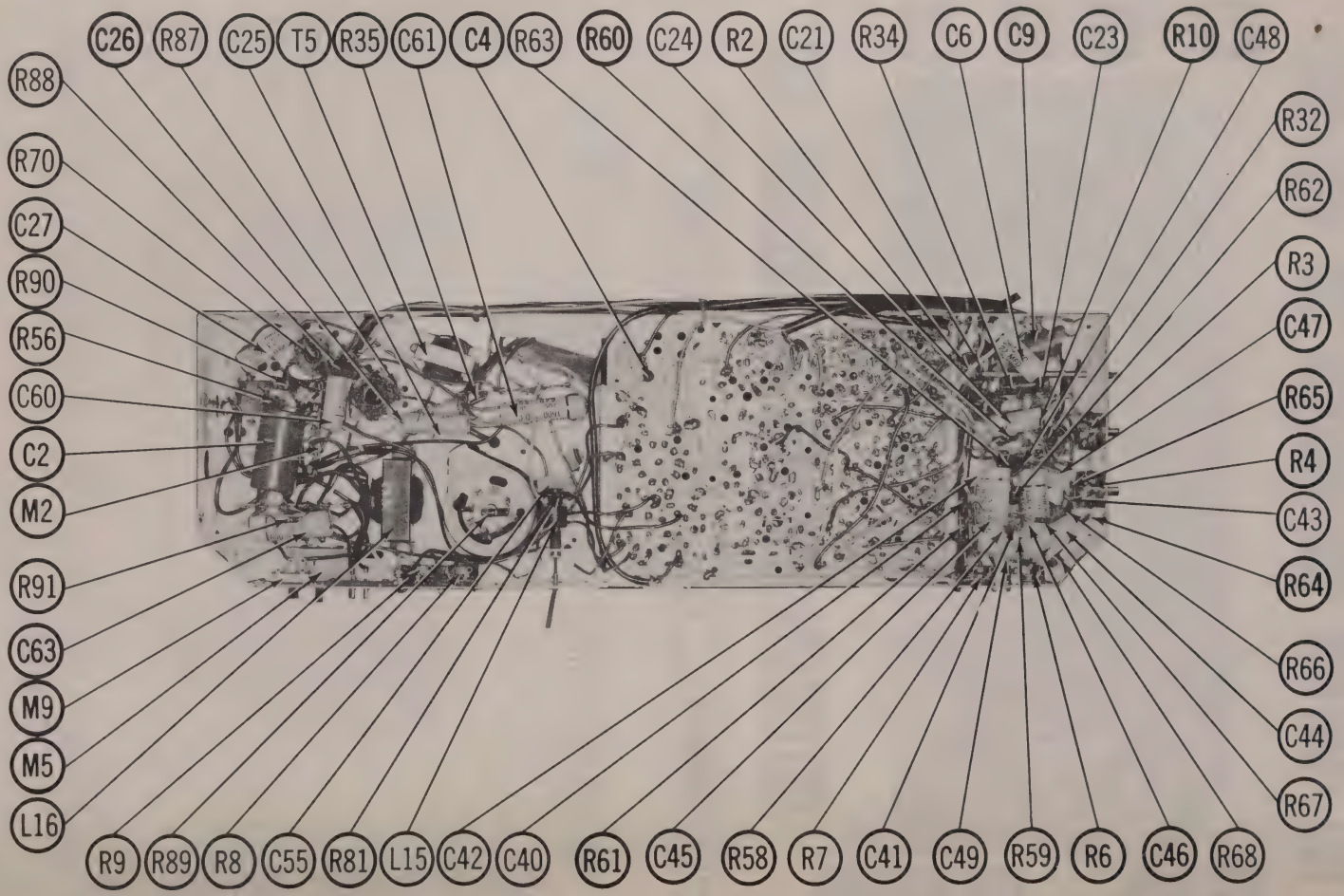


A Howard W. Sams CIRCUITRACE® Photo

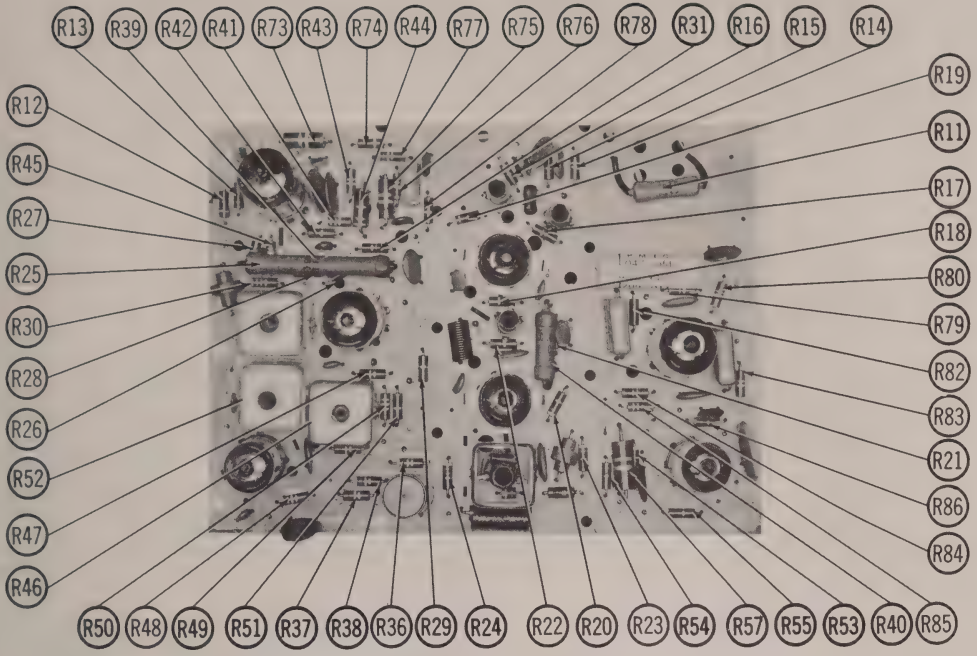
REMOTE CONTROL RECEIVER 7E2
PRINTED BOARD - BOTTOM VIEW



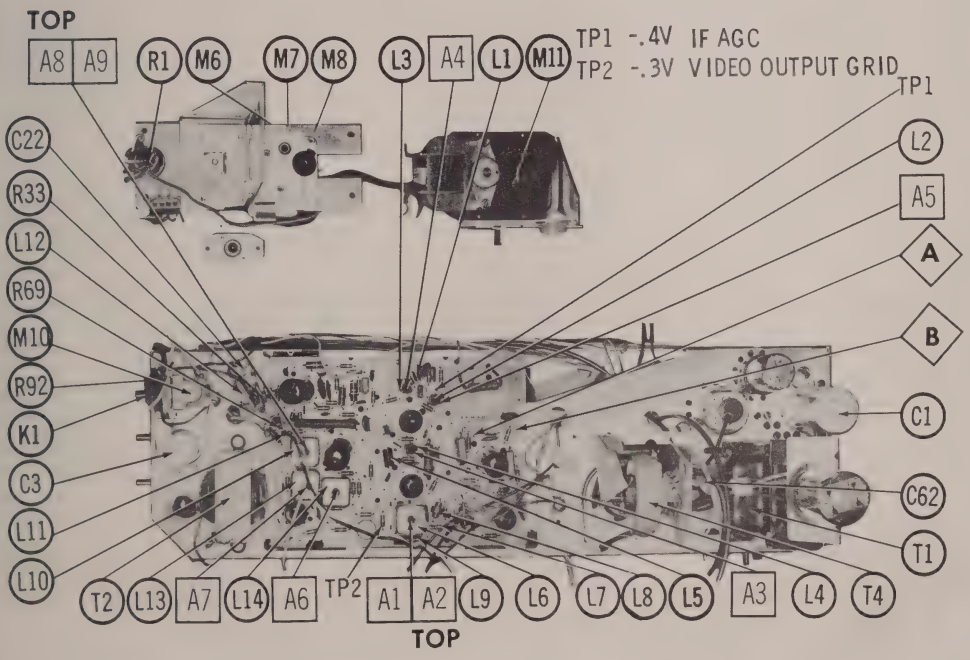
REMOTE CONTROL RECEIVER 7E2 PRINTED BOARD - TOP VIEW



TV CHASSIS - BOTTOM VIEW



TV PRINTED BOARD - RESISTOR IDENT.



TV CHASSIS - TOP VIEW

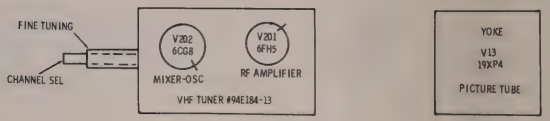
RESISTANCE MEASUREMENTS

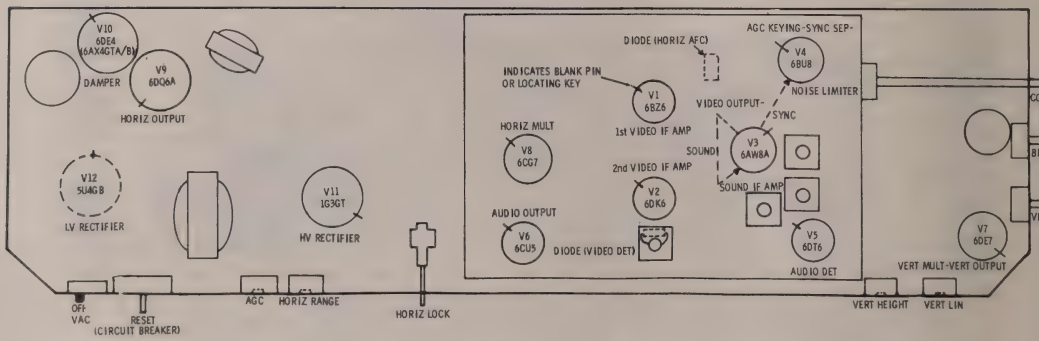
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	150K	43Ω	0Ω	.1Ω	▪ 3900Ω	▪ 3900Ω	0Ω		
V2	6DK6	0Ω	150Ω	.1Ω	0Ω	▪ 470Ω	▪ 470Ω	0Ω		
V3	6AW8A	0Ω	100K	60K	.1Ω	0Ω	0Ω	4700Ω	▪ 7500Ω	† 5000Ω
V4	6BU8	▪ 0Ω	† 7000Ω	2meg	0Ω	.1Ω	● † 25K	† 1meg	† 47K	† 12meg
V5	6DT6	17Ω	560Ω	.1Ω	0Ω	†600K	▪ 8200Ω	560K		
V6	6CU5	¶	NC	.1Ω	0Ω	600K	† 390Ω	† 630Ω		
V7	6DE7	† 360Ω	NC	1.6meg	0Ω	.1Ω	● † 4meg	1meg	● 200K	● 600Ω
V8	6CG7	† 12K	2.5meg	1200Ω	0Ω	.1Ω	† 82K	● 50K	1200Ω	0Ω
V9	6DQ6A	NC	.1Ω	NC	† 15K	1meg	TP	0Ω	0Ω	TOP CAP † 10Ω
V10	6DE4	TP	NC	¶	NC	† 60Ω	NC	.1Ω	0Ω	
V11	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP † 375Ω
V12	5U4GB	NC	¶	NC	28Ω	NC	31Ω	NC	¶	
V13	19XP4	.1Ω	39K	† 2.8meg	† 100K	NC	NC	● 200K	0Ω	
V201	6FH5	47Ω	6meg	0Ω	.1Ω	† 9500Ω	0Ω	47Ω		
V202	6CG8	4700Ω	▪ 5700Ω	0Ω	0Ω	.1Ω	▪ 2000Ω	▪ 1000Ω	0Ω	225K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 3 OF V10.
† MEASURED FROM PIN 8 OF V12.
▪ MEASURED FROM 135V SOURCE

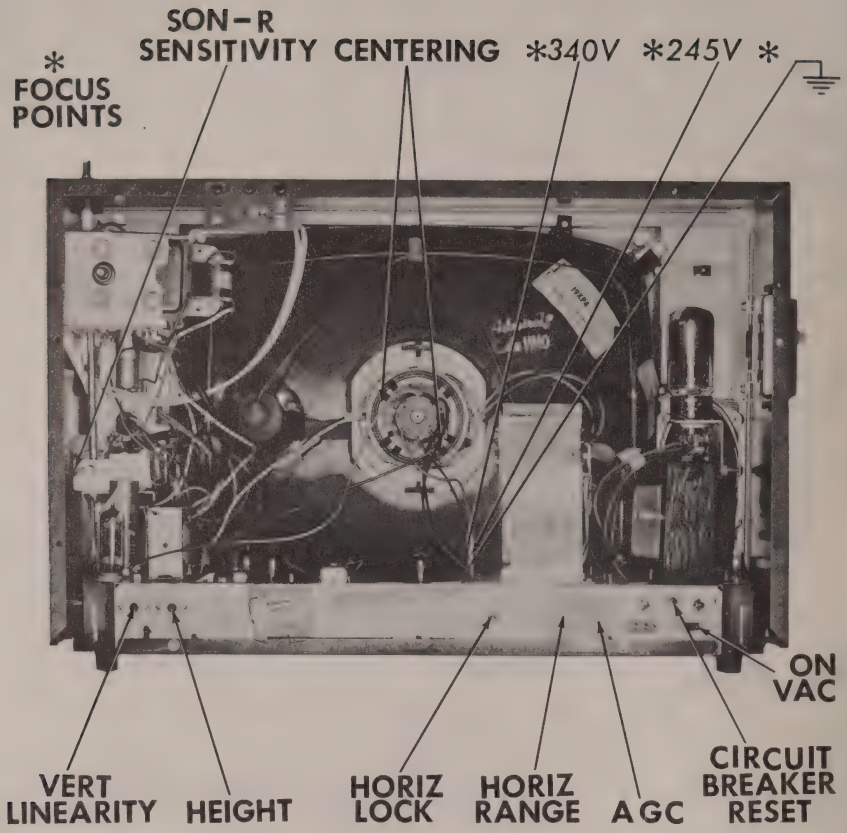
NC NO CONNECTION
TP TIE POINT

BOTTOM VIEW





TUBE PLACEMENT CHART



CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CABINET REMOVAL MODEL PSI9J17I

1. Remove 10 metal screws holding rear cover. Remove rear cover.
2. Remove 2 push-on type knobs in front of cabinet and 3 push-on type knobs at side of cabinet.
3. Disconnect speaker leads and antenna leads.
4. Remove 3 screws on each side (at bottom) Holding cabinet. Remove 6 screws around edge of cabinet (inside) holding front mask.
5. Remove cabinet.

CHASSIS AND PICTURE TUBE REMOVAL

NOTE: Access to components underneath chassis can be reached by removing lower chassis plate (shield).

1. Follow steps 1 thru 5 of "Cabinet Removal".)
2. Remove 6 chassis bolts holding chassis to picture tube mounting assembly. Remove yoke, hi voltage lead, and picture tube socket.
3. Remove chassis.
4. Remove Tuner and Control Panel Assembly.
5. Remove 4 screws holding picture tube to mounting assembly.
6. Lift picture tube out (with front mask remaining to lower panel).

PHOTOFACT® Folder

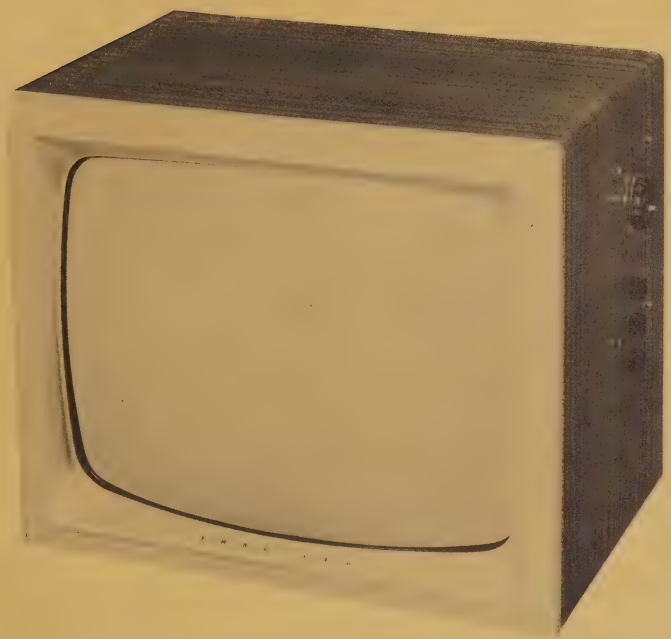
TRAV-LER MODELS 23K6075, 23MT6059 (Ch. 1051-60)

IMPORTANT FILING NOTICE

The TV Folder for this envelope will be found among the first folders in this complete Set of folders.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

TRAV-LER MODELS 23K6075, 23MT6059 (Ch. 1051-60)



TRAV-LER MODELS 23K6075, 23MT6059 (Ch. 1051-60)

MODEL 23MT6059 (CH. 1051-60)

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

TRAV-LER MODELS 23K6075, 23MT6059 (Ch. 1051-60)

TRAV-LER MODELS 23K6075, 23MT6059 (Ch. 1051-60)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

NOTE: Chassis and picture tube may be removed (as a unit) by removing 3 screws on each side (at bottom, holding mounting board) and one at top of cabinet holding picture tube bracket. The following steps are for "Chassis Removal" only.

1. Remove 10 metal screws holding rear cover. Remove rear cover.
2. Remove 5 push-on type knobs at side of cabinet.
3. Remove 4 screws at side of cabinet holding control panel.
4. Remove speaker leads, high voltage lead, picture tube socket, and yoke plug.
5. Remove 6 chassis bolts.
6. Remove chassis.

PICTURE TUBE REMOVAL

It is necessary to remove the chassis for picture tube removal. (See "Chassis Removal".)

MODEL 23MT6059 (CH. 1051-60)

TRADE NAME	Trav-Ler Models 23K6075, 23MT6059 (Ch. 1051-60)
MANUFACTURER	Trav-Ler Radio & Tele. Corp., 571 West Jackson Blvd., Chicago 6, Illinois
TYPE SET	Television Receiver
TUBES	VHF - Sixteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 195 Watts, 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of the picture tube.

FUSE

A 3/4A S/B fuse is used for LV supply protection. (For location, see "Tube Placement Chart".)

A fuse wire is used for filament protection. (For location, see M3 in photo "Chassis - Bottom View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

The AGC may be varied by means of an AGC Control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by connecting the lead from pin 4 of the picture tube to various voltage points. (For location, see photo "Cabinet - Rear View".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

The Horizontal Frequency Slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

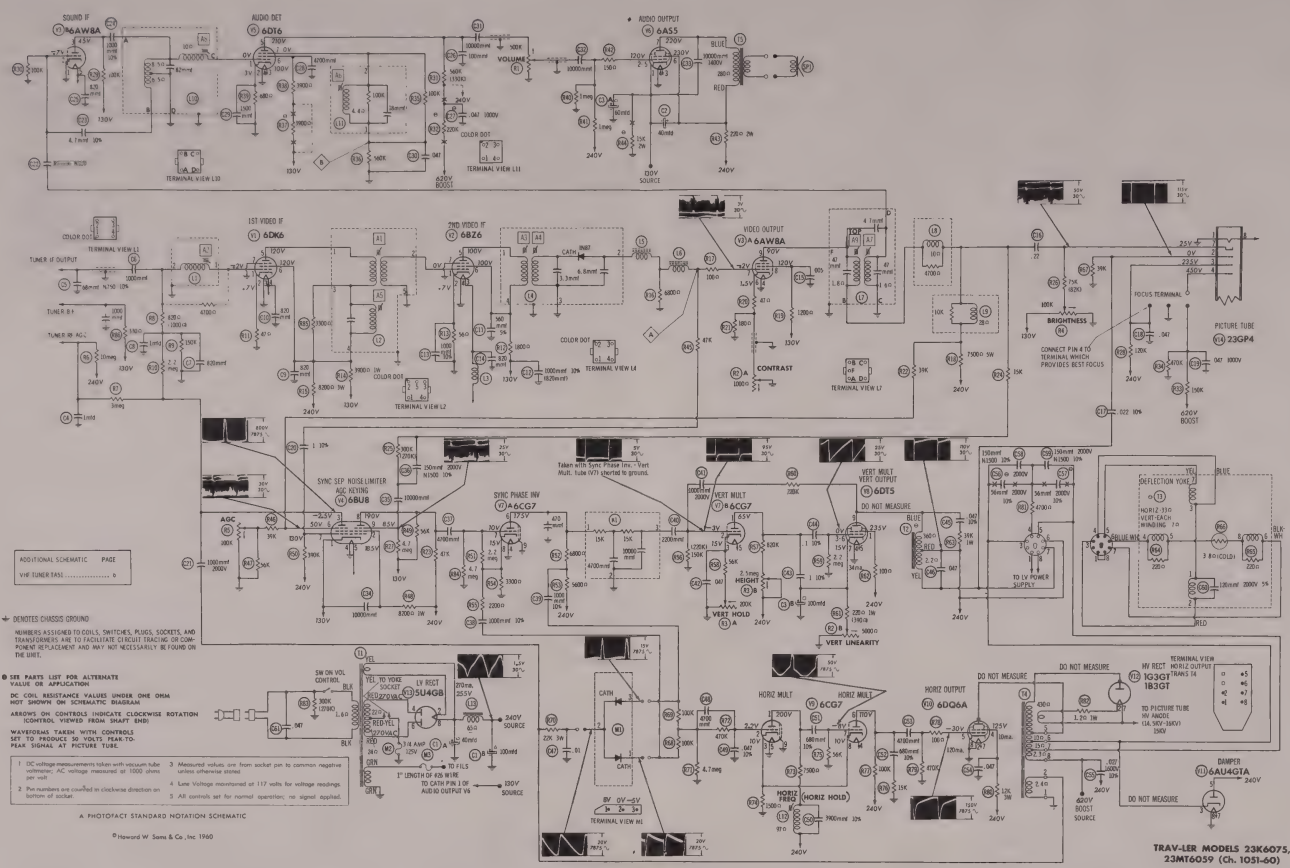
CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

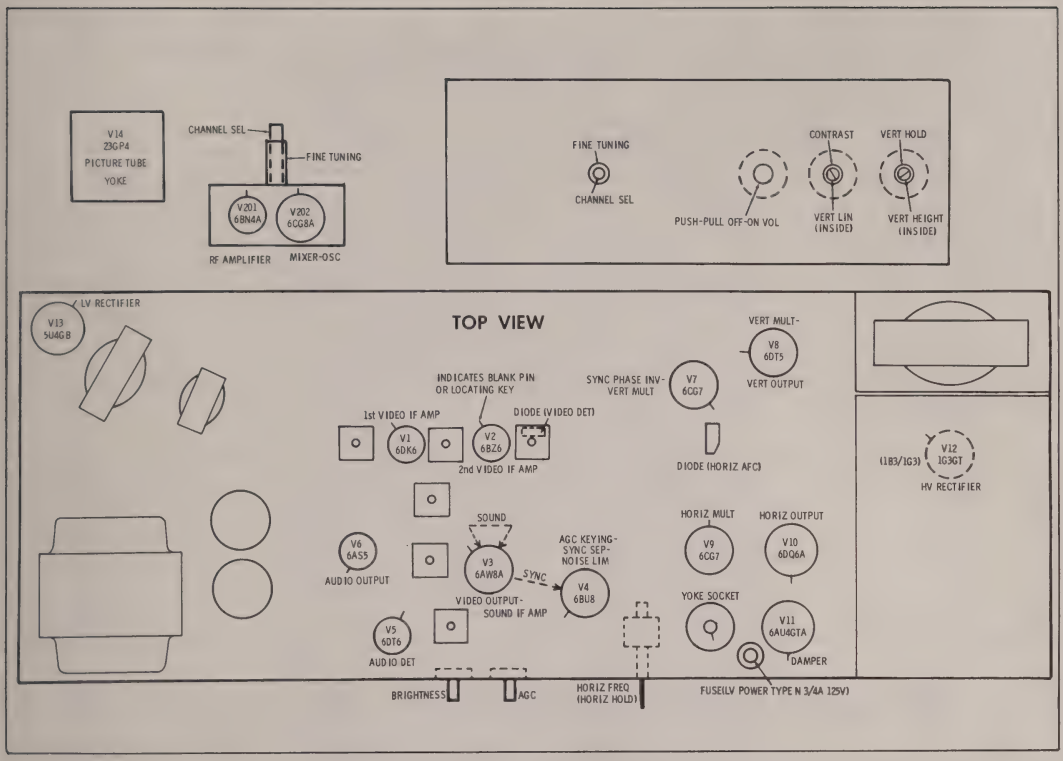
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KA336


SOUND IF
AUDIO DET
AUDIO OUTPUT
VOLUME
1ST VIDEO IF
2ND VIDEO IF
VIDEO OUTPUT
CONTRAST
BRIGHTNESS
FOCUS TERMINAL
PICTURE TUBE
23GP4
SYNC SEP NOISE LIMITER
AGC KEYING
SYNC PHASE INV
VERT MULT
VERT OUTPUT
DO NOT MEASURE
HEIGHT
VERT HOLD
VERT LINEARITY
DEFLECTION YOKE
HORIZ MULT
HORIZ OUTPUT
HORIZ FREQ
(HORIZ HOLD)
DAMPER
SW ON VOL CONTROL
LV RECT
TERMINAL VIEW
HV RECT
HORIZ OUTPUT TRANS
TO PICTURE TUBE HV ANODE
TO POWER SUPPLY
TO FILS
1" LENGTH OF #26 WIRE TO CATH PIN 1 OF AUDIO OUTPUT V6
ADDITIONAL SCHEMATIC PAGE
VHF TUNER TASS 6
DENOTES CHASSIS GROUND
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1 DC voltage measurements taken with vacuum-tube voltmeter; AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket.
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings.
5 All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1960
TRAV-LER MODELS 23K6075, 23MT6059 (Ch. 1051-60)

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound V13, Fuse (LV Power)

SWEEP FAILURE
No raster, has sound V9, V10, V12, V14
No vertical deflection V7, V8
Poor vert. linearity or foldover V7, V8
Poor horiz. linearity or foldover V9, V10, V11
Narrow picture V9, V10, V11, V13
Vert. off freq. V7, V8
Horiz. off freq. Diode (Horiz. AFC), V9

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det.), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V14
Has pic, no sound V3, V5, V6
Overloaded picture V4

SYNC FAILURE
No vert. sync V4, V7
No horiz. sync V4, Diode (Horiz. AFC), V7
No vert. or horiz. sync V4, V7

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Set Contrast fully counterclockwise.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Place a thin insulated metal strip between the Mixer-Osc. tube and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	44.0MC (10MC Swp.)	41.25MC 42.25MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 10K to point (A). Low side to chassis. (Across Video Det. load.)	A1, A2, A3, A4, A5 & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls low frequency side of curve, A2 controls high frequency side, A3 is adjusted for proper tilt, A4 for MINIMUM dip, A5 to place 41.25MC marker in trap notch and Mixer Plate Coil is adjusted for maximum gain.

SOUND IF ALIGNMENT

Tune in a strong TV signal and adjust A6 for maximum undistorted sound. If two peaks occur, connect the DC probe of a VTVM to point (B). Common to chassis. Adjust to the peak that produces the highest deflection on the VTVM. Reduce the signal strength (by disconnecting the antenna or connecting an attenuator in series with the antenna) until a hiss is heard in the sound. Adjust A7 and A8 for maximum undistorted sound. Reduce the signal strength even farther and retouch A7 and A8 for maximum undistorted sound. If necessary, repeat the above procedure.

4.5MC TRAP ALIGNMENT

Tune in a strong TV signal and set Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible. Adjust A9 for MINIMUM beat interference.

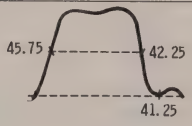
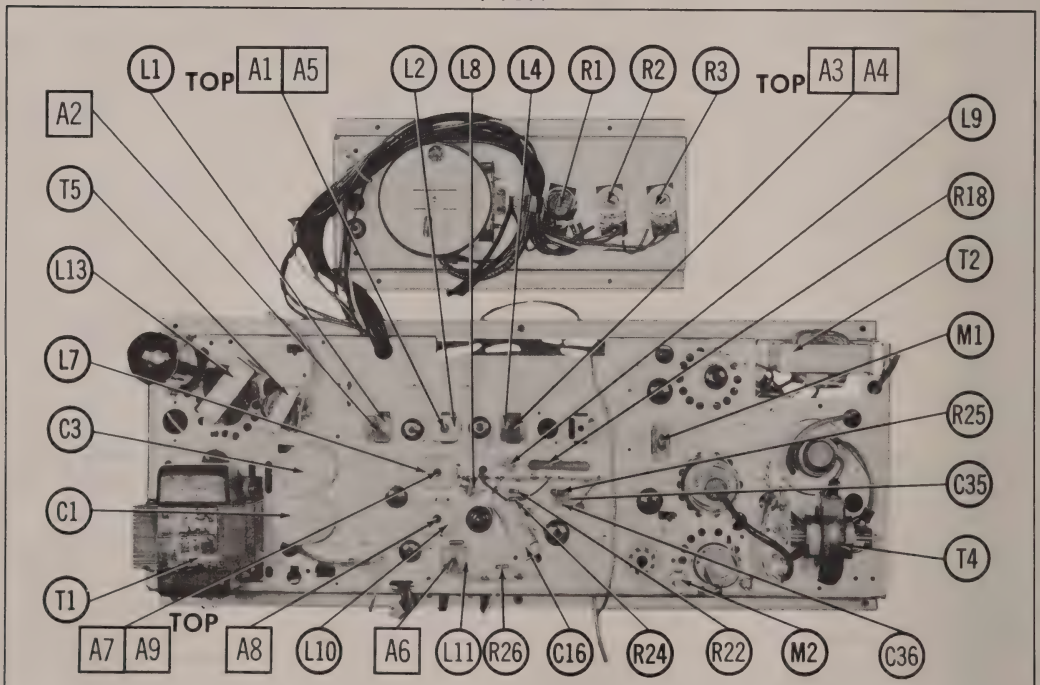
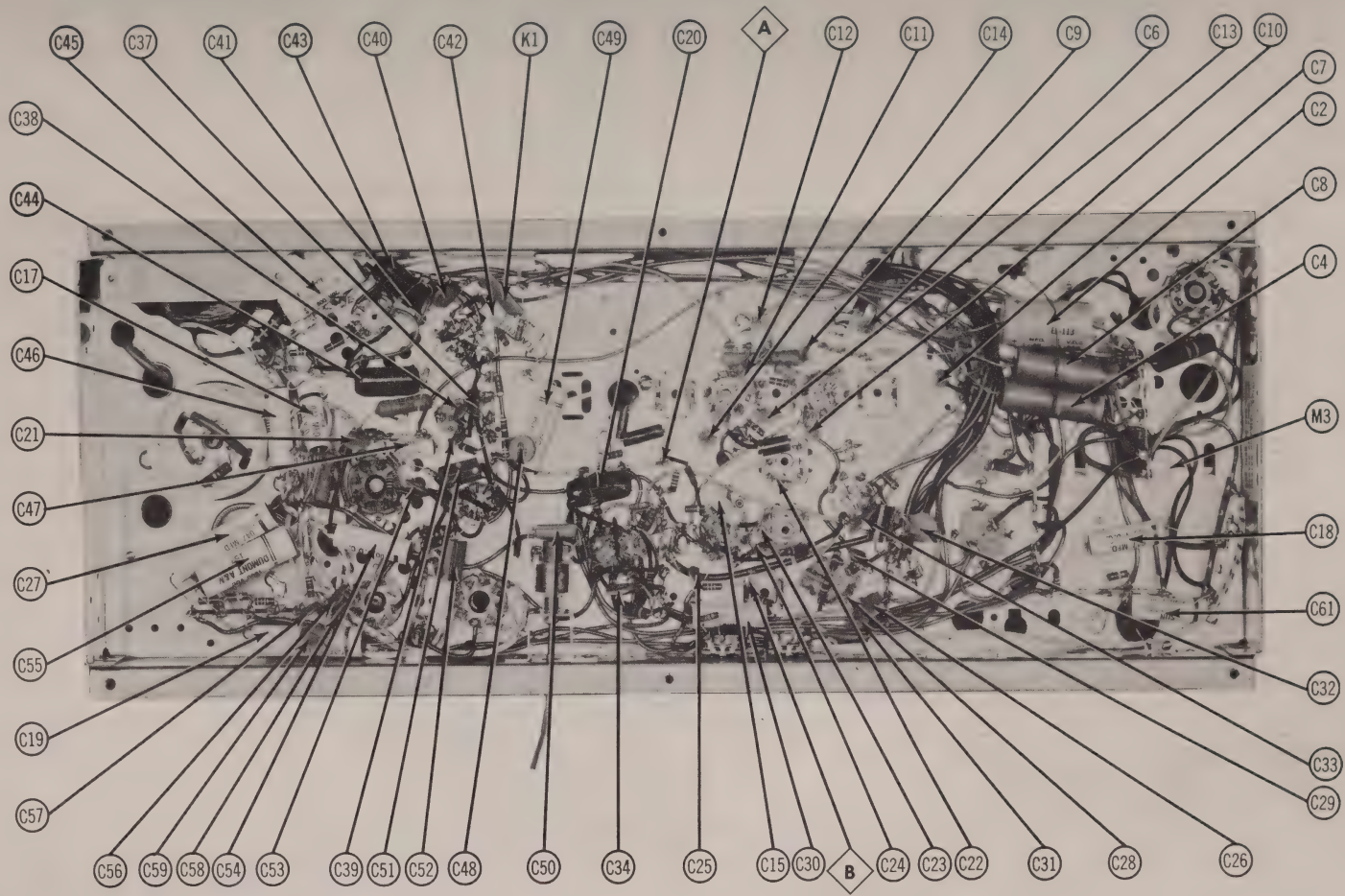


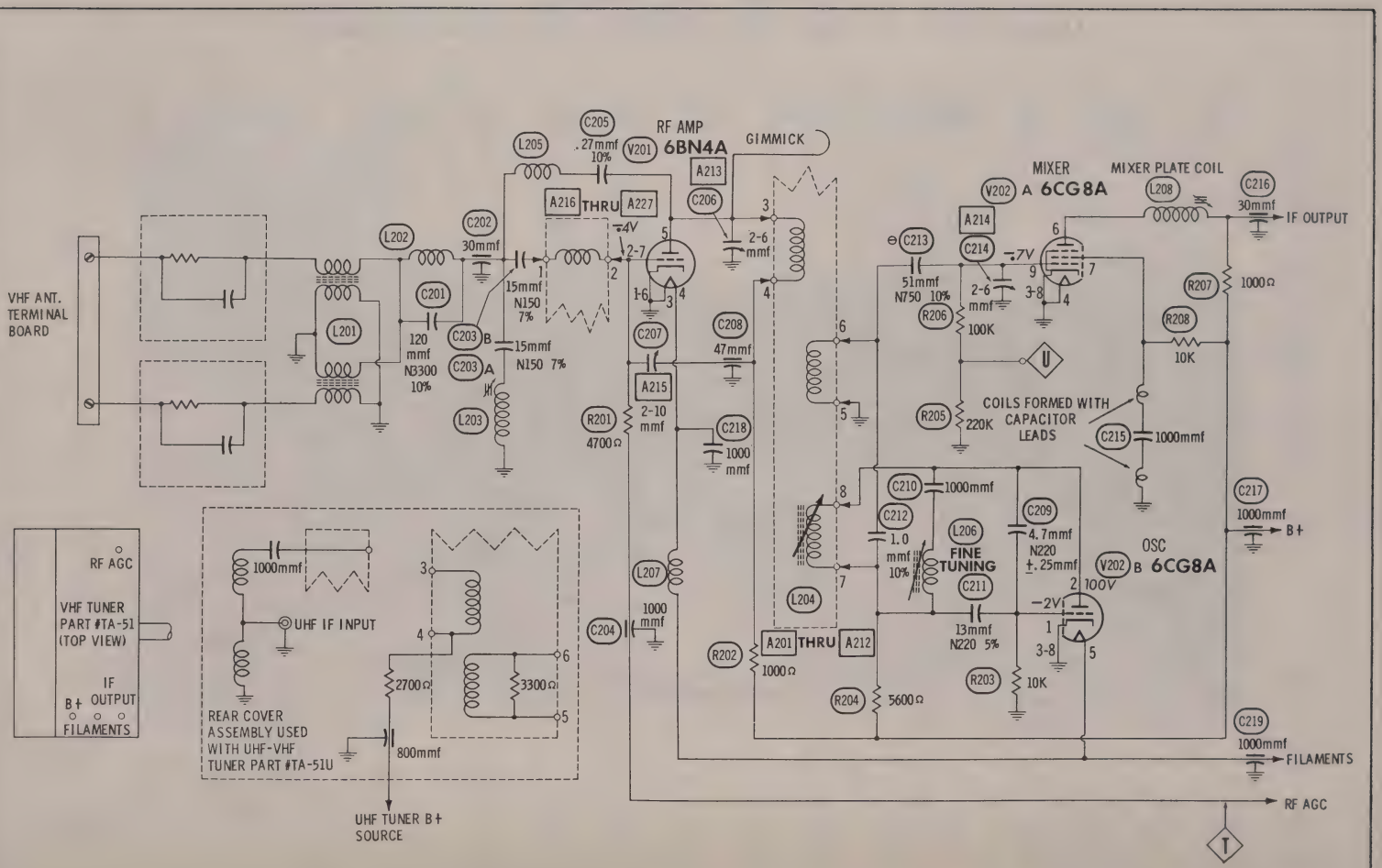
FIG. 1



CHASSIS—TOP VIEW



CHASSIS BOTTOM VIEW - CAPACITOR, MISC., & ALIGN. IDENT.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960

TUNER TA-51, U

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: A201 thru A212 ..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531
A213, A214, A215..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2525

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Set the Fine Tuning to the center of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

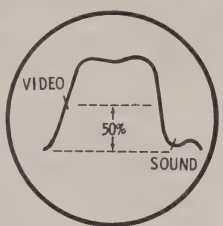


FIG. 201

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.
Connect the negative lead of a 4.5 volt bias supply to point Ⓣ. Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A213, A214, A215	Adjust A213 and A214 for maximum amplitude and symmetry with markers as shown in Fig. 202. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A215 to obtain MINIMUM response on the scope. Restore bias.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A216	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by compressing or expanding coil turns.
			207MC	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

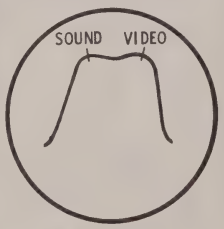


FIG. 202

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	GENERAL ELECTRIC * USE	TYPE	ITEM No.	RAYTHEON * SYLVANIA * USE	TYPE
V1	1st Video IF Amp.	6DK6	V7	Sync Phase Inv. - Vert. Mult.	6CG7
V2	2nd Video IF Amp.	6BZ6	V8	Vert. Mult. - Vert. Output	6DT5
V3	Video Output - Sound IF Amp	6AW8A	V9	Horiz. Mult.	6CU7
V4	AGC Keying - Sync Sep - Noise Limiter	6BU8	V10	Horiz. Output	6DQ6A
V5	Audio Det.	6CS8	V11	Damper	6AU4GTA
V6	Audio Output	6AB5	V12	HV Rectifier	1G3GT (1B3GT/1G3GT) *
			V13	LV Rectifier	5U4GB

* Alternate

PICTURE TUBE

ITEM No.	REPLACEMENT DATA: TRAV-LER PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
V14	23GP4					

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP	VOLT	REPLACEMENT DATA: TRAV-LER PART No.	ASEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	FYRAMD PART No.	SPRAGUE PART No.	NOTES
C1A	±40	350	EC-115	AFH2-54-25	BO653	FP347	TMD-2500	TVL-3750	
B	±100	350							
C2A	40	200	EC-113	BR4025	TC56	TD-40-350	TVA-1511		
B	200	200	EC-139	AFH2-80	BO656	FP338.8	TMD-2550	TVL-3559	
C	±100	50							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA: ASEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	1.0 100V		P388H-1.0		CUB2W1	1DP-5-104	GEM-II	2TM-MC
C5	1000 ±10%		WT80-D1 68	DTH-68	CUQ2S1	CCTN-680	CM7-680	10TC11-Q68
C6	1000		BP80-D31		BTA1QT1	CCD-102	B-350	5HE-D30
C7	820		DK-820		BTA1QT3	CCD-821	B-382	10TB-T92
C8	1.0 100V		P388H-1.0		CUB2W1	1DP-5-104	GEM-II	2TM-MC
C9	820		DK-820	DK-821	BTA1QT3	CCD-821	B-382	10TB-T92
C10	630		DK-830	DK-831	BTA1QT3	CCD-831	B-383	10TB-T93
C11	560	5%			SRS2T5S	CM-155-561J	MC2367	MS-356
C12	1000	10% (830) †	DK-1000	DD-101	BTA1QT3	CCD-103	GP320	10TB-D30
C13	1000	10%	DK-1000	DD-102	PM6CS	CCD-103	GP320	10TB-D30
C14	830		DK-830	DD-831	BTA1QT3	CCD-831	B-383	10TB-T93
C15	930 400V		P468N-006	DE-503	CUB4D6	6DP-1-502	GEM-S22	5TM-D50
C16	.22 400V		P468N-23		CUD4P22	6DP-5-334	GEM-S223	5TM-P22
C17	.022 600V	10%	V84C822-10K		PM6S22	6DP-3-223	GEM-1611	5TM-S22
C18	.047 600V		P468N-047	DD-503	CUB6S47	6DP-3-473	GEM-1647	5TM-S47
C19	.047 1000V		P1068N-047		CUB6D647	16DP-5-473	GEM-10647	10TM-S47
C20	.1 600V	10%	V84C5P-10%		PM6P1	6DP-5-104	GEM-1001	5TM-P1
C21	1000 2000V		HVD-30-1000	DD80-102	HVB20D1X	3CCD-102	2HV-210	B1-D10
C22	.47 N330					3CCD-471J		10TCN-Q47
C23	4.7	10%	NPO-S1 4.7	TCE-4R7	CDV47C	CCTO-4R7	CM0-547	10TCC-Y47
C24	1000	10%	DK-1000	DD-102	SRS2X	CCD-102	GP320	10TB-D30
C25	830		DK-830	DD-831	BTA1QT3	CCD-831	B-382	10TB-T93
C26	100	10%	BPD-0001	DD-101	LU7T	CCD-101	GP310	10TB-T10
C27	.047 1000V	①	P1068N-047		CUB1G647	16DP-5-473	GEM-10647	10TM-S47
C28	4700		BPD-0047	DD-473	BTA1QD4TM	CCD-472	B-347	5HE-D47
C29	1500		BPD-0015	DD-153	BTA1QD2S	CCD-152	B-315	5HE-D15
C30	.047 200V		P388H-047	DD-503	CUB3A47	6DP-3-473	GEM-4647	5TM-S47
C31	10000		BPD-01	DD-163	BTA1QS1	CCD-103	B-310	5HE-S5
C32	10000		BPD-01	DD-153	BTA1QS1	CCD-103	B-310	5HE-S10
C33	10000 1400V		DAC-37	DD6E-103	BTE1S6	CCD-103	UAC-110	B1-S10
C34	6700		BPD-01	DD-103	BTA1QS1	CCD-103	B-310	5HE-S03
C35	10000		BPD-01	DD-153	BTA1QS1	CCD-103	B-310	5HE-S03
C36	150 2000V	N1500 10%						
C37	6700		BPD-0047	DD-473	BTA1QD4TM	CCD-472	B-347	5HE-D47
C38	1000	10%	DK-1000	DD-102	SRS2X	CCD-102	GP320	10TB-D30
C39	1000	10%	DK-1000	DD-102	SRS2X	CCD-102	GP320	10TB-D30
C40	2200		BPD-0022	DD-223	BTA1QD22	CCD-222	B-322	5HE-D22
C41	.047 200V		P388H-047	DD-503	CUB3B47	6DP-3-473	GEM-4647	5TM-S47
C42	.047 200V		P388N-047	DD-503	CUB3B47	6DP-3-473	GEM-4647	5TM-S47
C43	.1	600V 10%	V84C5P-10%		PM6P1	6DP-5-104	GEM-1001	5TM-P10
C44	.1	600V 10%	V84C5P-10%		PM6P1	6DP-5-104	GEM-1001	5TM-P10
C45	.047	600V 10%	V84C5S47-10%		PM6S47	6DP-5-473	GEM-1653	5TM-S47
C46	.047	600V	P568N-047	DD-503	CUB6S47	6DP-3-473	GEM-6547	5TM-S47
C47	.01	600V	P568N-01	DE-103	CUB6S	6DP-3-103	GEM-651	5TM-S10
C48	4700		BPD-0047	DD-473	BTA1QD47	CCD-472	B-347	5HE-D47
C49	.047	600V 10%	V84C5S47-10%		PM6S47	6DP-5-473	GEM-1653	5TM-S47
C50	3900	10%	1484-0039		1SD39	CM-200-392K	MC246S25	MS-329
C51	560	10%	1484-0056		SRS756	CM-195-561K	MC2345	MS-368
C52	680	10%	1484-0068		SRS768	CM-195-681K	MC2349	MS-368
C53	4700		BPD-0047	DD-472	BTA1QD47M	CCD-472	B-347	5HE-D47
C54	.047	600V	P568N-047	DD-503	CUB6S47	6DP-3-473	GEM-6547	5TM-S47
C55	.027	1800V 10%			DPM5E625	VCM-20-183J		
C56	56	2000V 10%	①			VCM-20-560K	3DT-456	
C57	56	2000V 10%	①			VCM-20-560K	3DT-456	
C58	150	2000V N1500 10%	Pt. #CC-142					
C59	150	2000V N1500 10%	Pt. #CC-142					
C60	120	2000V 5%						
C61	.047	600V	P568N-047	DD-503	CUB6S47	6DP-3-473	GEM-6547	5TM-S47

† Alternate Value. ① May not be used in some versions.
* Not normally in distributor's stock. Available thru distributor or order to manufacturer.

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K		VC-120	BPL-60	C47S-500K-2*	B13-123	SP55A	Volume
B	Switch	1		Not Req.	Not Req.	SE7		Push-Pull Off-On

CONTROLS (cont)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS - IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R2A	1000		VC-195A	F1-5				Contrast
B	5000			R2-19				Vert. Linearity
R3A	200K		VC-194A	F1-52		‡(a)-1130	‡(a)-6287	Vert. Hold
B	2.5meg			R2-76				Height
R4A	100K		VC-84	T7-40	B47-100K-S	‡(a)-1130	‡(a)-4121	Brightness
B	Shaft			Not Req.	Not Req.	Not Req.	Not Req.	
R5A	100K		VC-84	T7-40	B47-100K-S	B11-128	PTA15L	AGC
B	Shaft			Not Req.	Not Req.	B11-123	PTA15C	

* Use KSS-3 Shaft.
† "CONCENTRIKIT" Equivalent: K-15 Kit with Base Elements and Shafts: B11-108, P17-038 (Panel) B11-114, R15-005 (Rear)
‡ "CONCENTRIKIT" Equivalent: K-15 Kit with Base Elements and Shafts: B11-129, P17-038 (Panel) (Not available as a factory assembled unit.) B11-339, R15-005 (Rear)
a "ETA-LOC" Equivalent: FA15S, RU53A, C6875A, 13437.
a "ETA-LOC" Equivalent: FA15L, RU53L1, C6875L, 13437.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R6	10meg		R33	150K		R63	100Ω	
R7	56K		R34	470K		R63	39K 1W	
R8	820Ω	(1000Ω) *	R35	100K		R64	220Ω	
R9	330K		R36	560K		R65	220Ω	
R10	2.2meg		R37	3900Ω	Note 1	R66	3.6Ω (Cold)	
R11	470		R38	3900Ω	Note 1	R67	39K	
R12	1600Ω		R39	680Ω		R68	100K	
R13	560		R40	1meg		R69	100K	
R14	3900Ω 1W		R41	1meg		R70	22K 3W	(Pt. #2R-278 IRC #PW5-2250)
R15	820Ω 5W	(Pt. #2R-283 IRC #PW5-8200Ω)	R42	150Ω				
			R43	220Ω 3W		R71	4.7meg	
R16	680Ω		R44	12K 2W	Note 2	R72	10K	
R17	100Ω		R45	47K		R73	7500Ω	
R18	7500Ω 5W	(Pt. #2R-287 IRC #PW5-7500Ω)	R46	33K		R74	1500Ω	
			R47	56K		R75	56K	
R19	1200Ω		R48	8200Ω 1W		R76	15K	
R20	47K		R49	56K		R77	10K	
R21	180Ω		R50	39K		R78	100Ω	
R22	39K		R51	2.2meg		R79	470K	
R23	47K		R52	680Ω		R80	12K 3W	(Pt. #2R-275 IRC #PW5-2250)
R24	18K		R53	5600Ω				
R25	300K	(270K) *	R54	3300Ω		R81	470Ω	
R26	75K	(82K) *	R55	2200Ω		R82	1.5Ω 1W	
R27	4.7meg		R56	150K	(220K) *	R83	200K	(270K) *
R28	100K		R57	150K		R84	4.7meg	
R29	100K		R58	56K		R85	3300Ω	
R30	100K		R59	2.2meg		R86	330Ω	
R31	560K	(330K) *	R60	220K				
R32	220K	Note 3	R61	220Ω 1W	(390Ω) *			

* Alternate Value. Note 1. Some versions may use a single 8200Ω for R37 and R38.
† Note 2. May not be used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRAV-LER PART No.	REPLACEMENT DATA	
E1	Vert. Integrator	4700mmf, 10000mmf, 15K, 15K	CC-130	Centralab	PC-302

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	NOTES
L1	1st Video IF	L-150	TV-127	6231		RTC-8558	
L2A	2nd Video IF	L-153					
B	41.25MC Trap	L-151					
L3	Fil. Choke	L-154		BC-562	6604	VP-9	RTC-8515	1.5uh
L4	3rd Video IF Ass'y	L-152						
L5	RF Choke	L-160		BC-566	6612		RTC-8522	10uh
L6	RF Choke	L-159		TV-192	6515		RTC-8525	28uh
L7A	6.3MC Trap	L-154			1462IFT		RTC-9056	
B	1st Sound IF							
L8	Series Peaking	L-162 ①					①Wound on 4700Ω Resistor
L9	Shunt Peaking	L-163 ②					②Wound on 10K Resistor
L10	2nd Sound IF	L-167					
L11	Quadrature Coil	L-108A	TV-154 *	1418 *	SD-5 *	RTC-8606 *	*Parallel with 100K Resistor

COILS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L12	Horiz. Stabilizer	L-156	TV-153 ①	6210 ①	H-102 ①	RC110 ①	RTC-8632L	HS-5 ①	WLC-25 ①

① Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS: CURRENT (Measured)	DC RES.	INDUCTANCE @ CURRENT (1000 ~)	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
L13	.375A	65Ω	1 Hy.	FC-18	C-2996	F-80X	C-3238	20C44	C-34X	

TRANSFORMER (POWER)

ITEM No.	RATING: USE	PRI.	SEC. 1	SEC. 2	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V @ 1.8A	117V	340VCT @ 370A DC	5V @ 3A	TR-92A							R-89BC①
	SEC. 3	SEC. 4	SEC. 5									
	6.3V @ 9A											

① Use MB-30 mounting kit for upright mounting.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Output	TR-50A		V-319			28S88	A-160X
	Alt. Vert. Output	TR-50						
	Yoke Horiz. (20MH) (10°) Vert. (4.24H))	L-174B		Y-110 ①② / PCM230T ③		DT-37A ③ / 39K ④	Y-93 ②③	Y-80-1 ③
	Alt. Yoke	L-174 ④						
T4	Horiz. Output	TR-81	HVO-152 *	X-161 *	RFH-172 *	HO-304 *	FLY-137 *	D-151 *

① Use original yoke plug; connect yoke terminal #2 to plug pin #3; yoke terminals #1 and #3 to plug pin #4; yoke terminal #10 to plug pin #6; yoke terminal #6 to plug pin #7; yoke terminal #4 to plug pin #8.
② Use original yoke plug. Connect same as original.
③ Use original damping network, if necessary.
④ Includes rear cover, centering device, and damping network.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

ORIGINAL TERMINAL CONNECTIONS	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
5	5	5	5	5	5	5 & 4
6	6	6	4	6	6	6
7	7	7	3	7	7	7
8	8	8	1	8	8	8
2	2	3	7	2	1	2
1	1	1	8	1	2	1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	SEC.	REPLACEMENT DATA: TRAV-LER PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4700Ω	3-4Ω	AT-50	A-3026	AU-401	A-3677	34S45	S-6X	

SPEAKER

ITEM No.	TYPE: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: TRAV-LER PART No.	QUAM PART No.	NOTES
SP1	8 1/4"	PM	3-4Ω	SPK-36	5A07	

RECTIFIERS

ITEM No.	RATING: CURRENT (Measured)	REPLACEMENT DATA: TRAV-LER PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1		SR-15 *	RGC1*				* Dual Selenium Diode

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: TRAV-LER PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M2	N	3/4A 125V A/B	F-13	F-14	233.750 (N 3/4A 125V B/B)	340010	N 3/4A	HN 1/2 to 3/4
M3	1"	length of #26 wire						

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M4	Tuner	TA-51	VHF

PARTS LIST AND DESCRIPTIONS (Continued)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Mask	MP-178	Model 23K6075
Mask	MP-177	Model 23MT6059
Knob	K-411	Fine Tuning, Model 23K6075
Knob	K-201	Fine Tuning, Model 23MT6059
Knob (Mahogany)	K-335A	Channel Selector, Model 23MT6059
Knob (Beige)	K-422	Channel Selector, Model 23MT6059
Knob (Beige)	K-420	On-Off Volume, Model 23MT6059
Knob (Beige)	K-421	Contrast, Vertical Hold, Model 23MT6059
Knob	K-409	Volume, Model 23K6075
Knob	K-410	Vert. Hold, Contrast, Model 23K6075
Cabinet	CA-396	Model 23K6075

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
	◆ GENERAL ELECTRIC ◆			◆ RAYTHEON ◆ SYLVANIA ◆	
V201	RF Amp.	6BN4A	V202	Mixer - Osc.	6CG8A

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N3300 10%	#13L-031				*		
C202	30							
C203A	15 N150 7%	#13L8PG150N2				*		10TCP-Q15
B	15 N150 7%					*		10TCP-Q15
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205	.27 10%	#13D-111-45						
C206	2-6			829-6		CV-3	CT552	
C207	2-10	#31B-902-09		829-10				
C208	47		EF-00005	MFT-50				
C209	4.7 N220 ±.25mmf	#13L8R4R7C				*		10TCR-V47
C210	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D1
C211	13 N220 5%	#13L8R130J				*		10TCR-Q12
C212	1.0 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C213	51 N750 10%	Note 1		TCN-51	C10Q51U			10TCU-Q50
C214	2-6			829-6		CV-3	CT552	
C215	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D1
C216	30							
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D1
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	

Note 1. Some versions may use 51mmf N470 10% in this application.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

NOTE: Part Numbers listed above are "Standard Coil" Part Numbers.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	4700Ω	
R202	1000Ω	
R203	10K	

ITEM No.	RATING	REMARKS
R204	5600Ω	
R205	220K	
R206	100K	

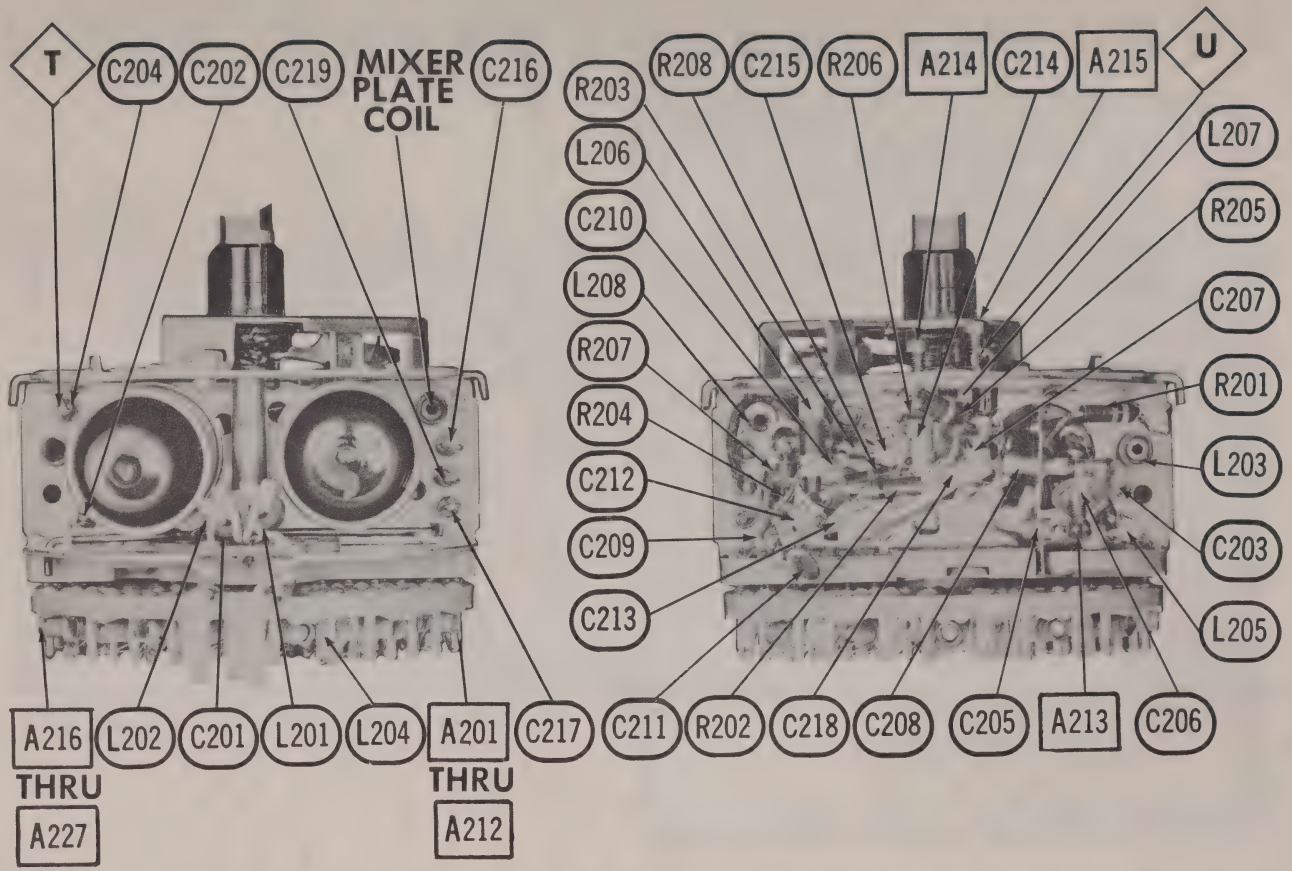
ITEM No.	RATING	REMARKS
R207	1000Ω	
R208	10K	

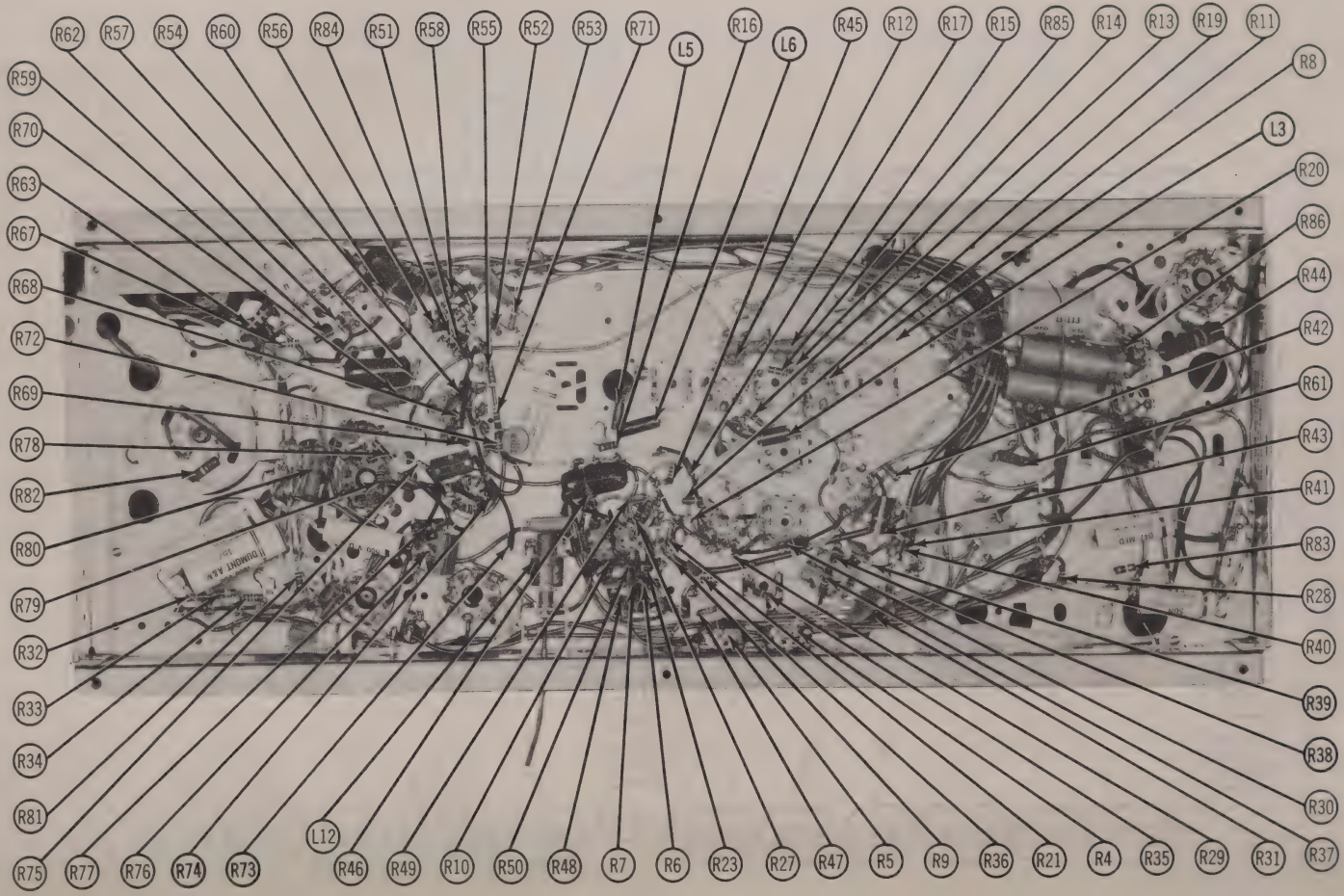
COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T3398-01	Includes L202, L203
L202	RF Choke	34A-748	
L203	IF Trap Coil	34A-762	
L204	Ant., RF, Mixer Grid & Osc. Coils	31T-3361-06	Includes Rotor Disc Assy.

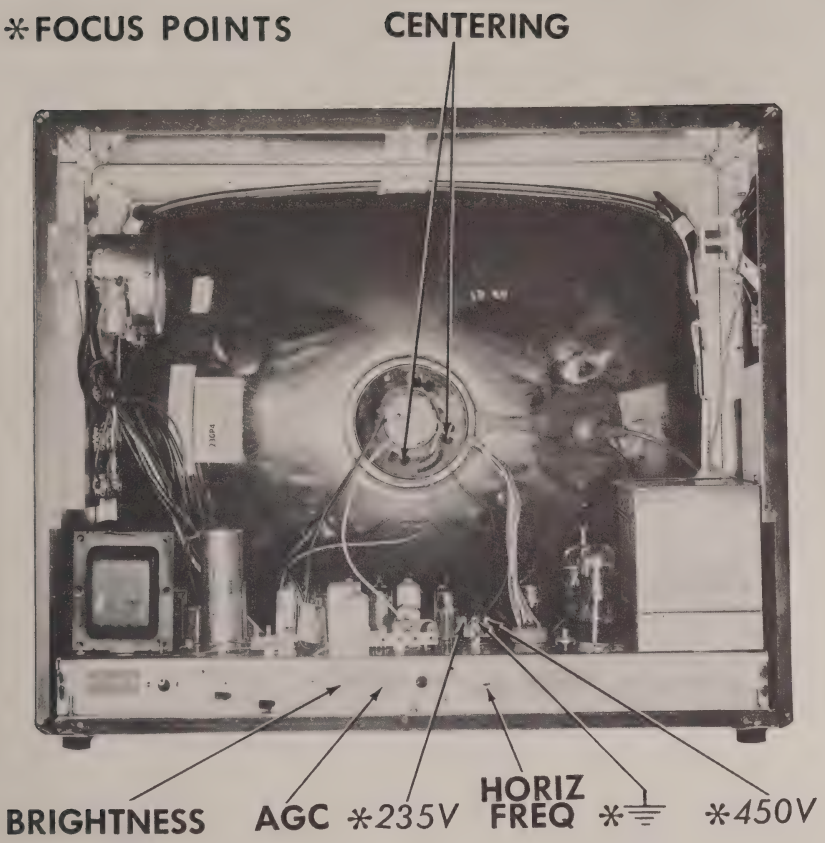
ITEM No.	USE	PART No.	NOTES
L205	RF Choke	34A-1005	
L206	Fine Tuning Coil	34A-787-03	
L207	Fil. Choke	31K-137-027	
L208	Mixer Plate Coil	31UA-580-017	

NOTE: Part Numbers listed above are "STANDARD COIL" Part Numbers.


T
C204
C202
C219
MIXER PLATE COIL
C216
R203
L206
C210
L208
R207
R204
C212
C209
C213
R208
C215
R206
A214
C214
A215
U
L207
R205
C207
R201
L203
C203
L205
A216
L202
C201
L201
L204
A201
C217
C211
R202
C218
C208
C205
A213
C206
THRU A227
THRU A212



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Set the Brightness and Contrast Controls for a normal picture.

Turn the Horizontal Frequency clockwise until the picture loses sync.

It may be necessary to switch off channel and back again for picture to lose sync.

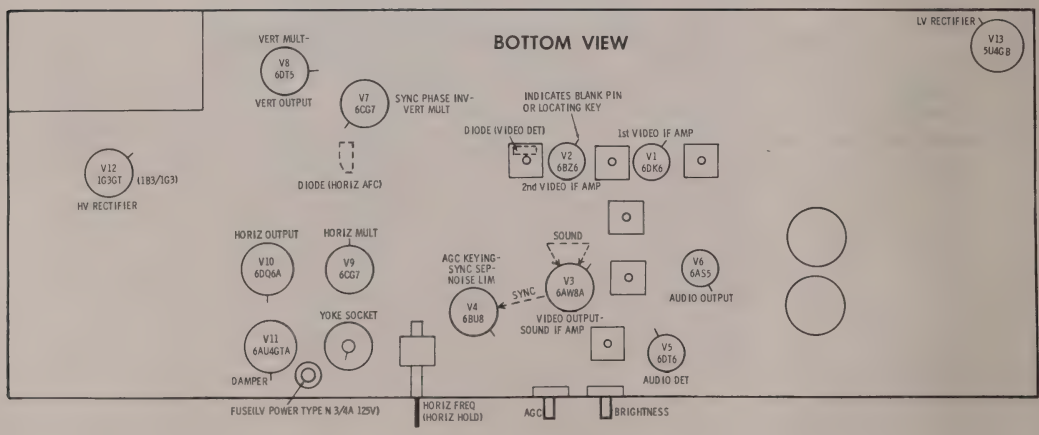
Turn the Horizontal Frequency slowly counterclockwise until the picture just falls into sync.

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6DK6	150K	47Ω	0Ω	.1Ω	▪3900Ω	▪3900Ω	0Ω		
V2	6BZ6	0Ω	56Ω	.1Ω	0Ω	▪1800Ω	▪1800Ω	0Ω		
V3	6AW8A	0Ω	100K	▪100K	0Ω	.1Ω	● 47Ω	6900Ω	▪1200Ω	†7500Ω
V4	6BU8	▪0Ω	†8200Ω	2.3meg	0Ω	.1Ω	● 40K	†390K	†30K	▪4.7meg
V5	6DT6	18Ω	680Ω	.1Ω	0Ω	†780K	▪8000Ω	560K		
V6	6AS5	¶	NC	.1Ω	0Ω	600K	†285Ω	†565Ω		
V7	6CG7	● †1.7meg	150K	● 150K	0Ω	.1Ω	†12K	●1.5meg	3300Ω	0Ω
V8	6DT5	†165Ω	NC	2.2meg	0Ω	.1Ω	NC	● 500Ω	NC	†425Ω
V9	6CG7	†7500Ω	1.2meg	1500Ω	.1Ω	0Ω	†100K	56K	1500Ω	0Ω
V10	6DQ6A	NC	0Ω	NC	†12K	470K	TP	.1Ω	0Ω	TOP CAP †10Ω
V11	6AU4GTA	NC	NC	¶	NC	†65Ω	NC	.1Ω	0Ω	
V12	1G3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †440Ω
V13	5U4GB	NC	¶	NC	22Ω	NC	24Ω	NC	¶	
V14	Z3GP4	0Ω	39K	†120K	†150K	NC	NC	●100K	.1Ω	
V201	6BN4A	0Ω	5.2meg	0Ω	.1Ω	▪1300Ω	0Ω	NC		
V202	6CG8A	10K	▪6000Ω	0Ω	0Ω	.1Ω	▪ 1300Ω	▪ 10K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM PIN 8 OF V13.
‡ MEASURED FROM PIN 3 OF V11.
▪ MEASURED FROM 130V SOURCE.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART

PHOTOFACT® Folder

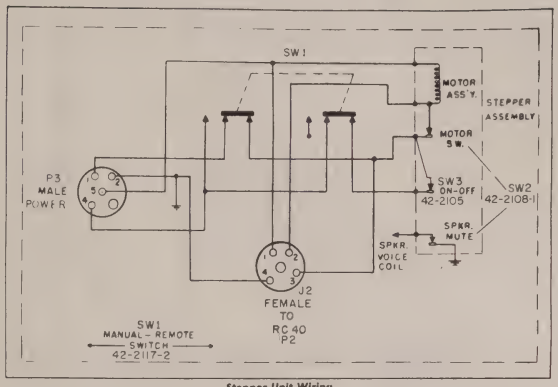
**PRODUCTION CHANGE
BULLETIN 247**

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 1 IN SET 479

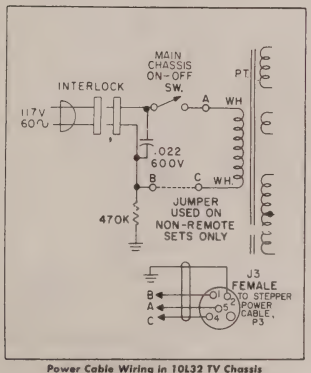
Philco Models H4668LR, R, H4673LR, R, UH4668LR, R, UH4673LR, R (Ch. 10L32, U) were covered in PHOTOFACT Folder 1 - Set 479.

During late production a Remote Control (RC-40) was added. A schematic diagram of RC-40 is shown in this bulletin.

(Continued On The Reverse Side)



Stepper Unit Wiring



Power Cable Wiring in 10L32 TV Chassis

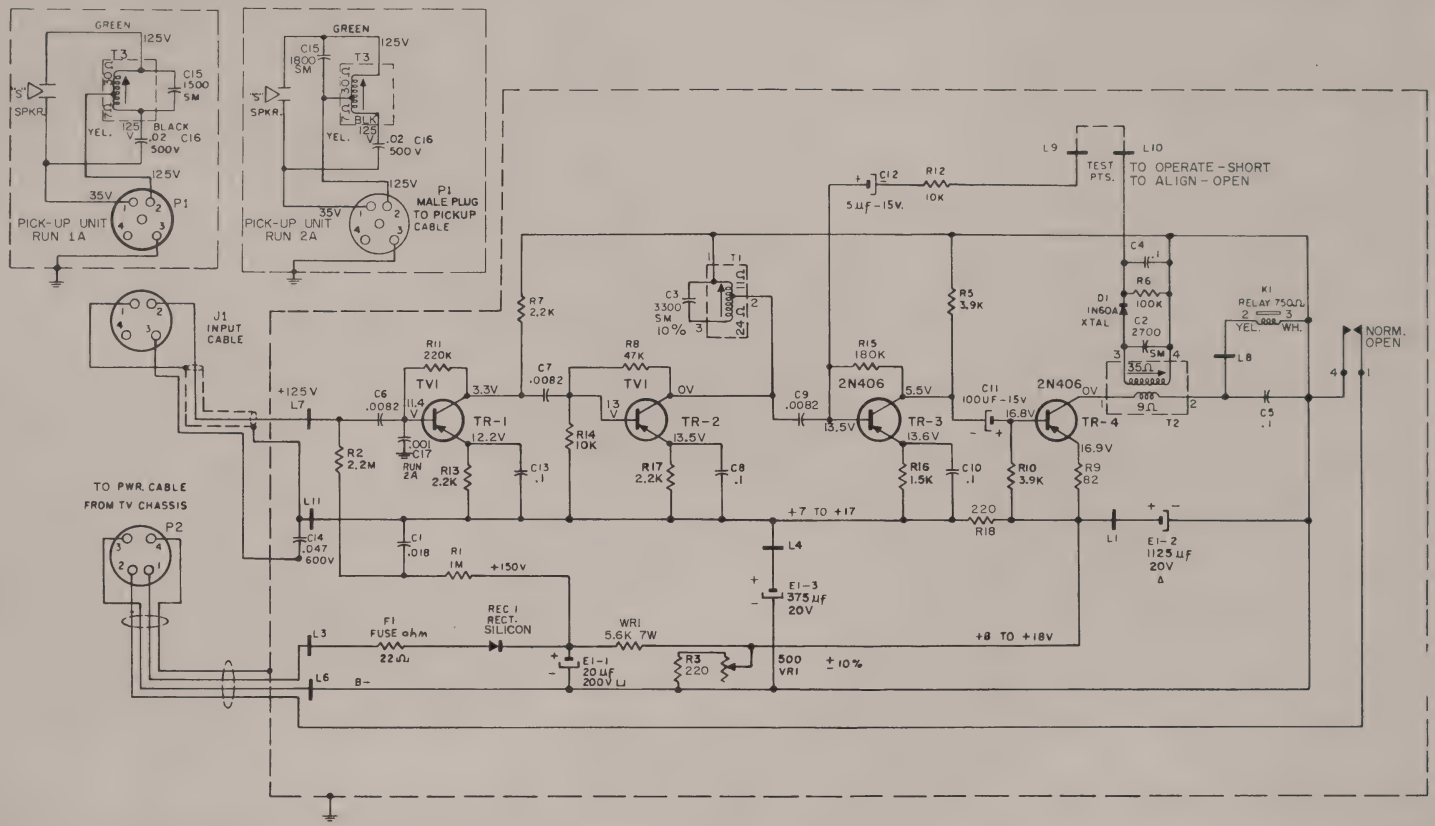
PHILCO MODEL RC 40

PRODUCTION CHANGE
BULLETIN 247

PRODUCTION CHANGE
BULLETIN 247

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



Schematic Diagram for RC-40 Receiver

Schematic Diagram Courtesy of Philco Corporation

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 7 IN SET 455

EMERSON MODELS 907B, 926B (CH. 120478B, 120505B)

Emerson Models 896B, 902 (Ch. 120455B, 120459B) were covered in PHOTOFACT Folder 7 - Set 455.

Models 907B, 926B (Ch. 120478B, 120505B) which are electrically similar except for the following changes are added with the publication of this bulletin.

COMPONENT CHANGES

R2A, B is changed to Part #390596 (Treble Tone Control).

An additional Bass Tone Control is added (Part #390597).

M7 is changed to Part #510162, Model 907B only.

M7 is omitted on Model 926B (Ch. 120505B). When M7 is omitted a different speaker hook-up is used. A partial schematic diagram showing the changes is given in this bulletin.

(Continued On The Reverse Side)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	461082	Tuning, Models 907B, 926B
Knob	461075	Loudness (Inner), Models 907B, 926B
Knob	461074	Loudness (Outer), Bass, Models 907B, 926B
Knob	461156	Treble Inner, Off-On, Models 907B, 926B
Knob	461076	Function Switch
Knob	461114	Speaker Selector, Model 907B
Cabinet	141029	Mahogany, Model 907B
Cabinet	141097	Mahogany, Model 926B
Cabinet	141029A	Limed Oak, Model 907B
Cabinet	141097A	Limed Oak, Model 926B
Cabinet	141029B	Walnut, Model 907B
Cabinet	141097B	Walnut, Model 926B
Speaker Cabinet	141098	Mahogany, Model 926B
Speaker Cabinet	141098A	Limed Oak, Model 926B
Speaker Cabinet	141098B	Walnut, Model 926B

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 13 IN SET 467

PHILCO MODELS T60, T62

Philco Models T60, T62 were covered in PHOTOFACT Folder 13 - Set 467.

The following changes were made during late production.

CONVERTER CIRCUIT CHANGES

R2 is increased from 1500Ω to 3300Ω.

R3 is increased from 560Ω to 1800Ω.

With these circuit changes the Converter Voltages will be different.

Base 1.1V, Emitter 1.2V, Collector 0V

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 12 IN SET 483

PHILCO MODEL T-1000

Philco Model T-1000 was covered in PHOTOFACT Folder 12 - Set 483.

The following changes were made during late production.

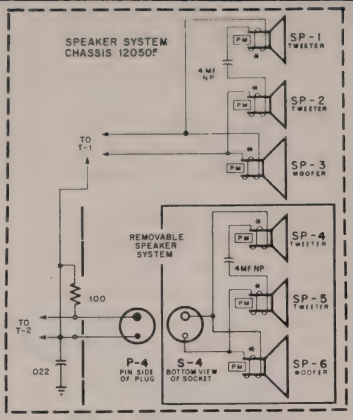
CONVERTER CIRCUIT CHANGES

R3 is increased from 1500Ω to 3300Ω.

R4 is increased from 560Ω to 1800Ω.

With these circuit changes the Converter Voltages will be different.

Base 1.1V, Emitter 1.2V, Collector 0V.

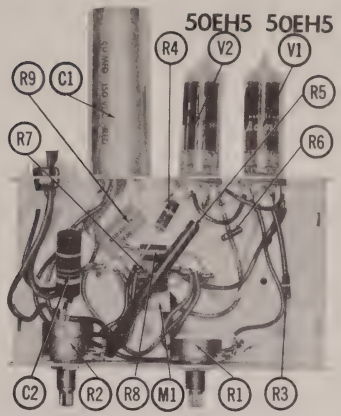

SPEAKER SYSTEM
CHASSIS 12050F
4 MF NP
SP-1
TWEETER
SP-2
TWEETER
SP-3
WOOFER
TO
T-1
REMOVABLE
SPEAKER
SYSTEM
SP-4
TWEETER
4MF NP
SP-5
TWEETER
SP-6
WOOFER
100
TO
T-2
.022
P-4
PIN SIDE
OF PLUG
S-4
BOTTOM VIEW
OF SOCKET

PHOTOFACT® Folder

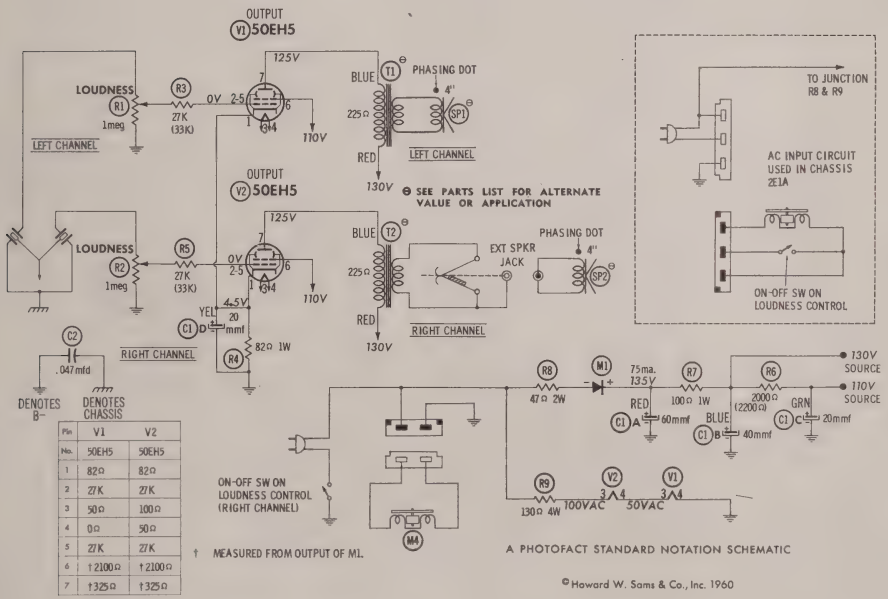
ADMIRAL MODELS 925, 929, 938 (Ch. 2E1, 2E1A)

ADMIRAL MODELS 925, 929, 938 (Ch. 2E1, 2E1A)

MODEL 925



TRADE NAME	Admiral Models 925, 929 (Ch. 2E1); 938 (Ch. 2E1A)
MANUFACTURER	Admiral Corp., 3800 Cortland Street, Chicago 47, Illinois
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier With 3 Speed Manual Record Player Model 938 Has 4 Speed Automatic Record Changer #A2400-001-013
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 26 Watts, .25 Amp. @117 Volts AC (Less Motor)



Pin	V1	V2
No.	50EH5	50EH5
1	82Ω	82Ω
2	27K	27K
3	50Ω	100Ω
4	0Ω	50Ω
5	27K	27K
6	†2100Ω	†2100Ω
7	†325Ω	†325Ω

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JR989

SET 506 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel Output	50EH5	V2	Right Channel Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	67B42-1	PR4-200	BBRT42215	TCT3114	TDLT-3	TVA-3455	
B	40	150			BR6015	TC68	TD-20-150	TVA-1410	
C	20	150							
D	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	½	75D1-127	B-70	A47-1meg-Z	Q13-137	U53	Loudness, Left Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	½	75D1-128①	B-70-S	A47-1meg-Z	Q13-137	U53	Loudness, Right Channel
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

① Chassis 2E1A uses Part #75D1-127 in this application

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	27K	(33K) *
R4	82Ω 1W	
R5	27K	(33K) *

ITEM No.	RATING	REMARKS
R6	2000Ω	(2200Ω) *
R7	100Ω 1W	
R8	47Ω 2W	

ITEM No.	RATING	REMARKS
R9	130Ω 4W	IRC#PW5-130Ω

* Alternate Value.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3000Ω	3-4Ω	79B88-1①	A-3025	AU-605	A-3332	24S53	S-12X	
T2	3000Ω	3-4Ω	79B88-1①	A-3025	AU-605	A-3332	24S53	S-12X	

① Alternate Part #79D88-1.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	78C160-1 *	4A07	* Used in Models 925, 929
SP2	4"	PM	3-4Ω	78C160-1 *	4A07	♦ Used in Models 938
	5"	PM		78C161-1 ♦		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	ADMIRAL PART No.	ITT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.		
M1	.075A	93B16-1 *	RE504 *	1N1763 *	2F4 *	SR200 *		* Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	ADMIRAL PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	409C37-1 (Includes M2)	76TS-TB		96				12TH5	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA		REMARKS
	ADMIRAL PART No.	JENSEN PART No.	
M3	98C95-4 †	CRA-57 † or CRA-57D ♦	† Jewel ♦ Diamond
	98C95-5 †	CRA-57X † or CRA-57XD ♦	

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Motor Ass'y.	400D710-1	Includes Motor & Turntable, Less Tone Arm
	Motor	407C28	Less Turntable, Model 938
M5	Tone Arm Ass'y.	400C707-1	Includes Cartridge & Needles for Models 925 & 929
	Tone Arm Ass'y.	400D661-40	Includes Cartridge & Needles for Model 938
	Switch	408A1	Reject-Off-On, Model 938

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	33B360-1	Loudness, Gray, Model 925
Knob	33B360-2	Loudness, Black, Model 929
Knob	33B360-3	Loudness, White, Model 938
Knob	403A86-4	Changer, Black, Model 938
Cabinet	35E550-1	Coral & Silver, Model 925
Cabinet	35E550-2	Blue & White, Model 929
Cabinet	35E551-1	Blue & Aqua, Model 938

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

ARKAY
MODEL ST-11

ARKAY
MODEL ST-11

ARKAY
MODEL ST-11

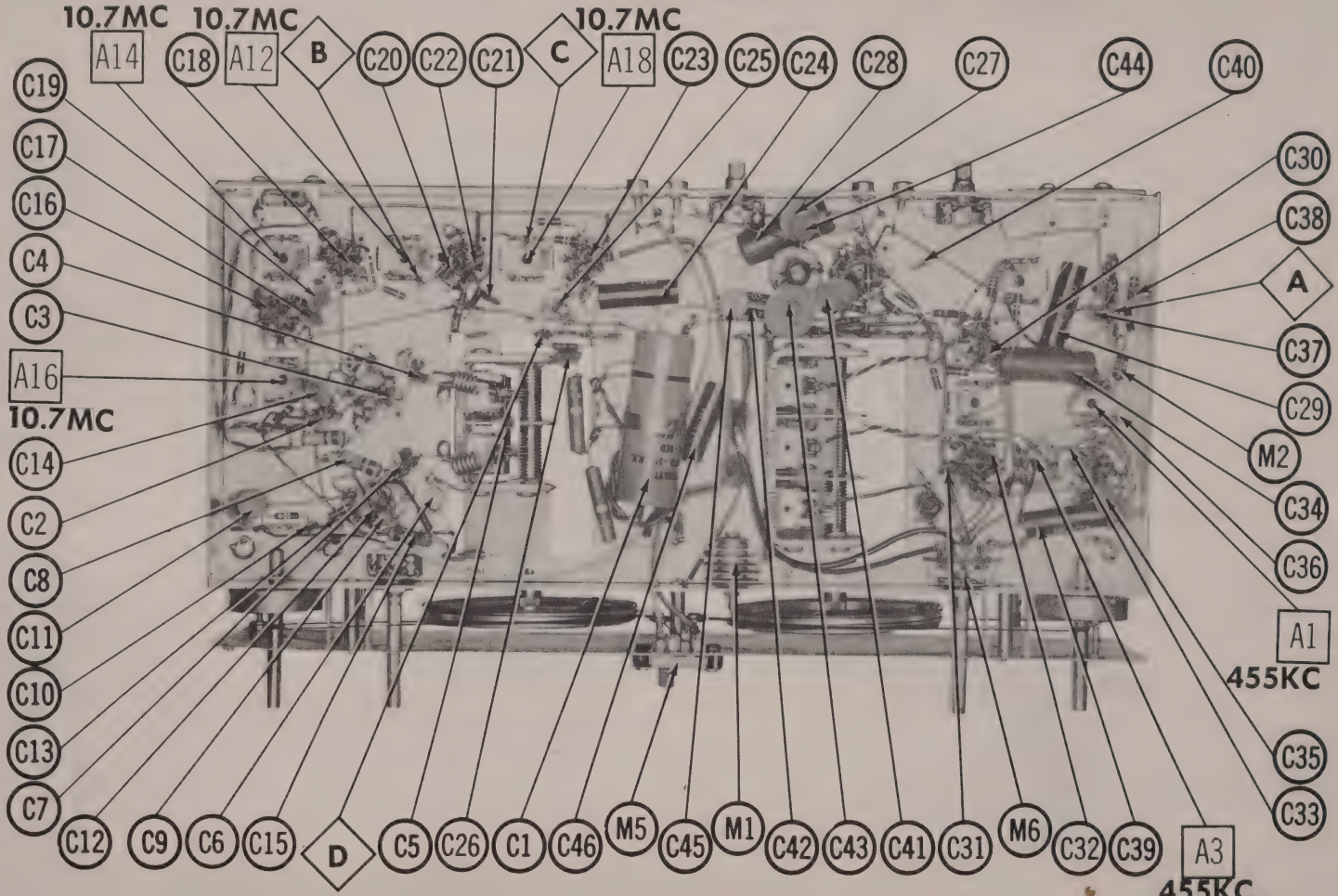
TRADE NAME	Arkay Model ST-11		
MANUFACTURER	Arkay International, Inc., 88-06 Van Wyck Expressway, Jamaica 18, N. Y.		
TYPE SET	AC Operated 10 Tube FM-AM Tuner		
POWER SUPPLY	110 – 120 Volts AC, 60 Cycles	RATING	48 Watts, .51 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	540 – 1650KC	FREQ. MOD.	88 – 108MC

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

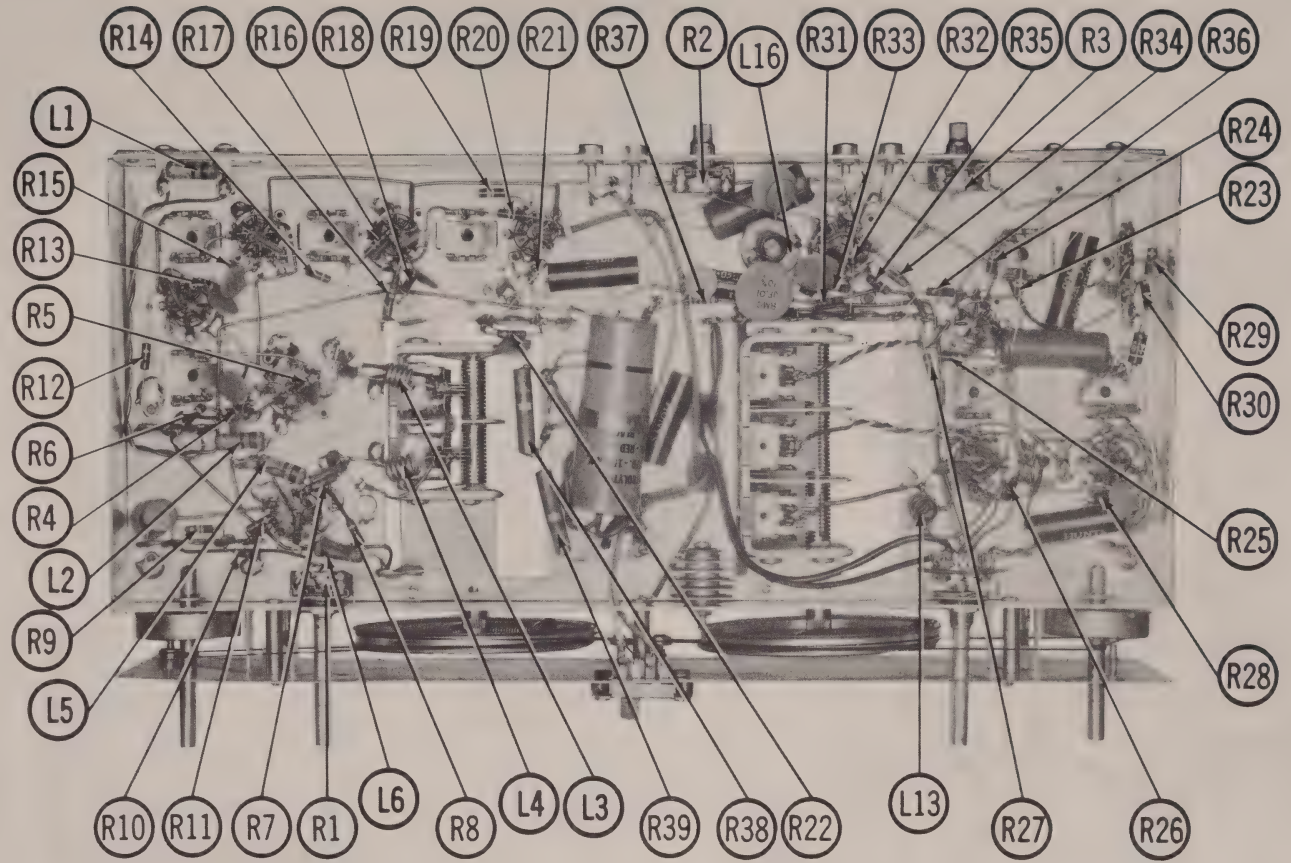
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KL025

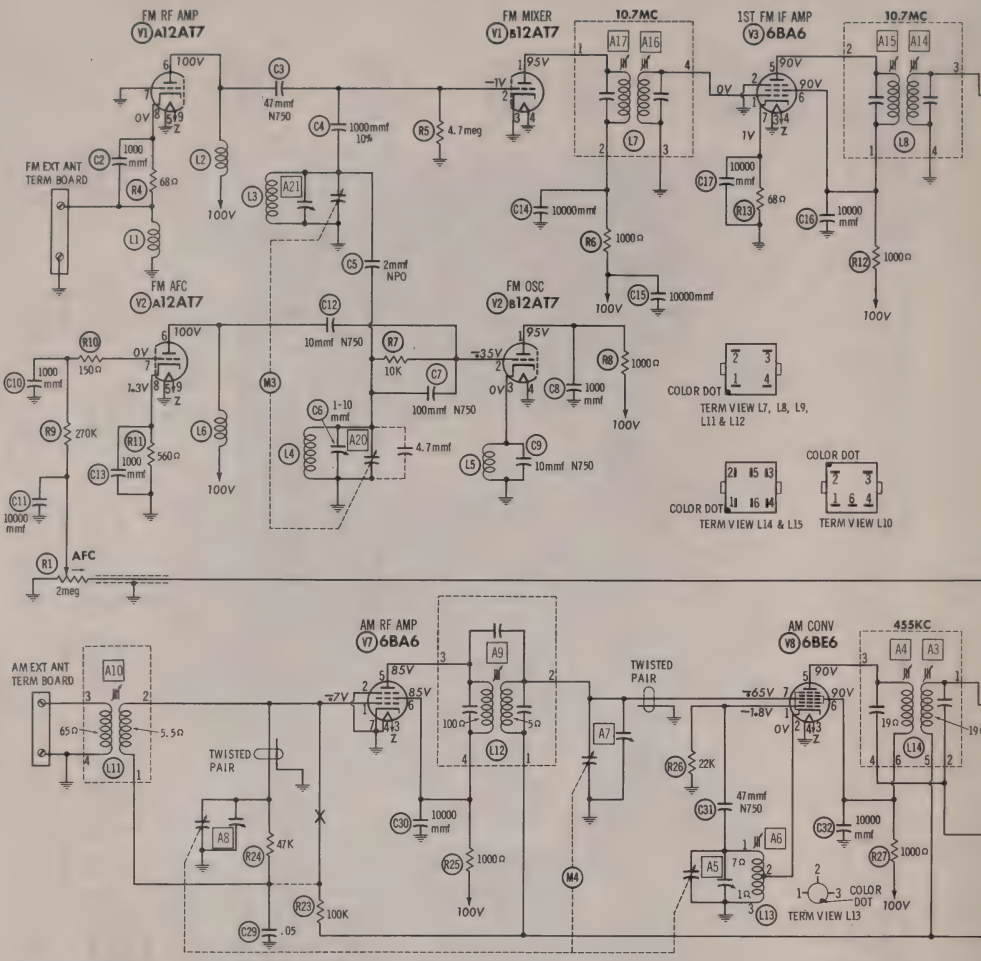
SET 506 FOLDER 5



CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AT7 ECC81	†1600Ω	4.7meg	0Ω	0Ω	0Ω	†660Ω	0Ω	68Ω	.1Ω
V2	12AT7 ECC81	†1600Ω	10K	0Ω	0Ω	0Ω	†660Ω	270K	560Ω	.1Ω
V3	6BA6 EF93	.8Ω	0Ω	0Ω	.1Ω	†1600Ω	†1600Ω	68Ω		
V4	6AU6 EF94	.8Ω	0Ω	0Ω	.1Ω	†1600Ω	†1600Ω	150Ω		
V5	6AU6 EF94	100K	0Ω	0Ω	.1Ω	†15K	†15K	0Ω		
V6	6AL5	0Ω	100K	0Ω	.1Ω	200K	0Ω	100K		
V7	6BA6 ECC93	3.7meg	0Ω	.1Ω	0Ω	†1700Ω	†1600Ω	0Ω		
V8	6BE6	22K	1Ω	.1Ω	0Ω	†1600Ω	†1600Ω	3.6meg		
V9	6BA6 ECC93	3.6meg	0Ω	.1Ω	0Ω	†680Ω	†660Ω	220Ω		
V10	12AU7 ECC82	†660Ω	1meg	11K	0Ω	0Ω	†660Ω	1meg	11K	.1Ω

ALL MEASUREMENTS TAKEN IN "AM-FM" POSITION.
† MEASURED FROM OUTPUT OF M1.

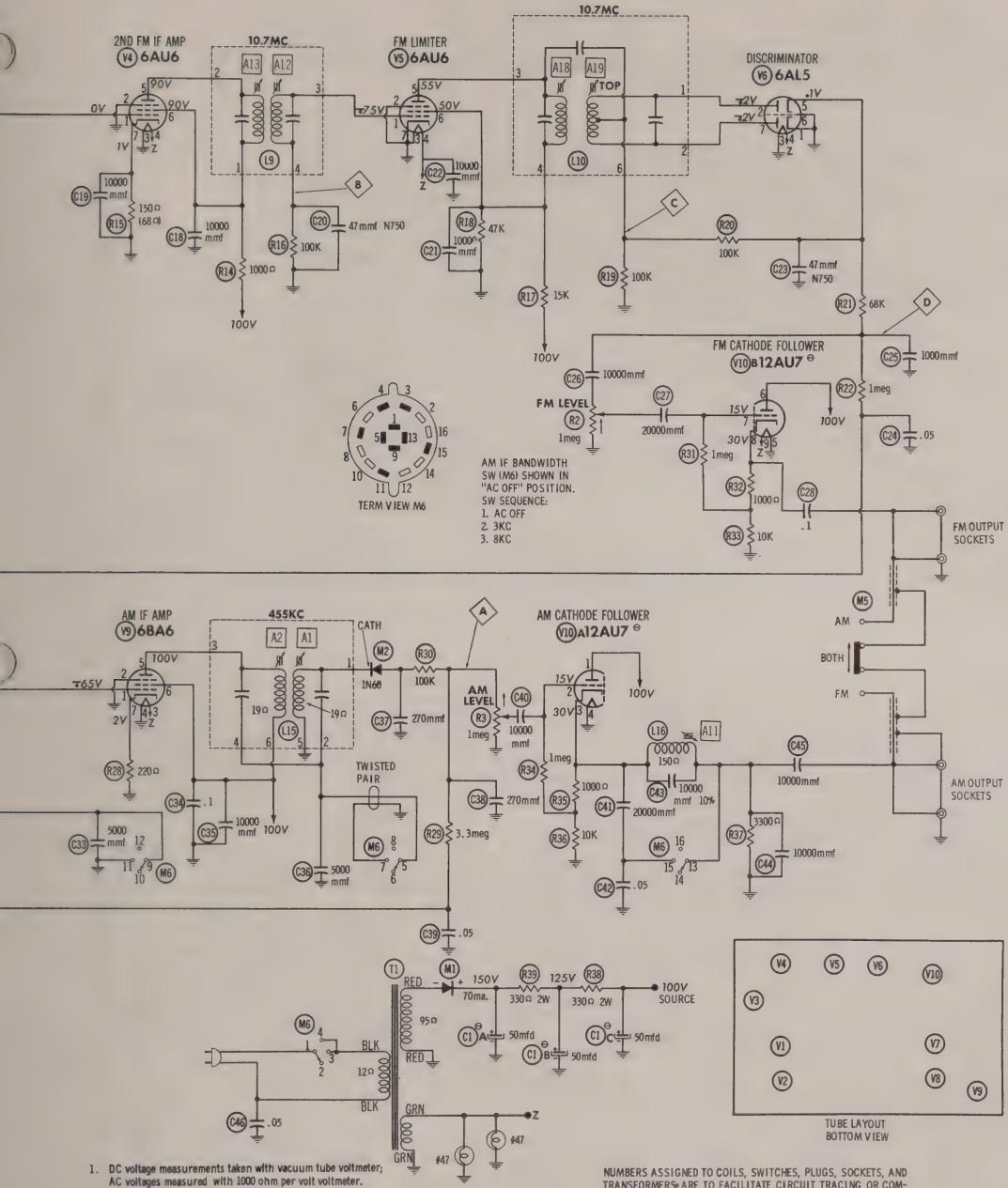
Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

ARKAY MODEL ST-11

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use only enough generator output to provide a usable indication.

Suggested Alignment Tools:

A1 thru A4, A9, A10, A12 thru A19	GENERAL CEMENT #5097, 8727 WALSCO #2515
A5, A7, A8, A21	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A6, A11, A20	GENERAL CEMENT #8721, 8722 WALSCO #2519

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (Unmod.)	(AM) Tuning gang fully open.	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	"	1650KC	"	"	A5	"
3.	"	600KC	600KC	"	A6	"
4.	Across AM Antenna terminals.	1400KC	1400KC Signal.	"	A7, A8	Adjust for maximum deflection while rocking tuning gang.
5.	"	600KC	600KC Signal.	"	A9, A10	"
6.	"	1400KC (10KC Mod.)	1400KC Signal.	AC probe across AM output jack.	A11	Adjust for MINIMUM deflection.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

Set AFC Fully counterclockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum deflection.
8.	"	"	"	DC probe thru 1meg to point Ⓒ. Common to chassis.	A18	"
9.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A19	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.
Set AFC Control fully counterclockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
7.	High side thru .01mfd to pin 2 (grid) of FM Mixer. Low side to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. Amp. to point Ⓑ. Low side to chassis.	A12, A13, A14, A15, A16, A17	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
8.	"	"	"	Vert. Amp. thru 27K to point Ⓒ. Low side to chassis.	A18	"
9.	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A19	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of cross-over lines.

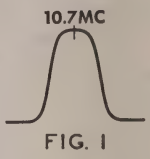


FIG. 1

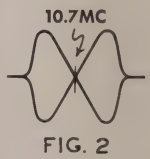


FIG. 2

FM RF ALIGNMENT—SELECTOR IN FM POSITION

Set AFC Control fully counterclockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	Across FM antenna terminals with 270Ω in high side.	108MC (Unmod.)	(FM) 108MC	DC probe to point Ⓑ. Common to chassis.	A20	Adjust for maximum deflection.
11.	"	98MC	98MC Signal.	"	A21	"

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (GENERAL ELECTRIC / RAYTHEON / SYLVANIA)
V1	FM RF Amp. -FM Mixer	12AT7/ECC81
V2	FM Osc. -FM AFC	12AT7/ECC81
V3	1st FM IF Amplifier	6BA6/EF93
V4	2nd FM IF Amplifier	6AU6/EF94
V5	FM Limiter	6AU6/EF94

ITEM No.	USE	TYPE
V6	Discriminator	6AL5
V7	AM RF Amplifier	6BA6/ECC93
V8	AM Converter	6BE6
V9	AM IF Amplifier	6BA6/ECC93
V10	FM Cathode Follower-AM Cathode Follower	12AU7/ECC82 (Note 1)

Note 1. Some versions may use 12AX7 in this application.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ARKAY PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	150		PRS3675	BBRT44415	WT458	TDLT-5	TVAS-3453.5*	①
B	50	150							
C	50	150							

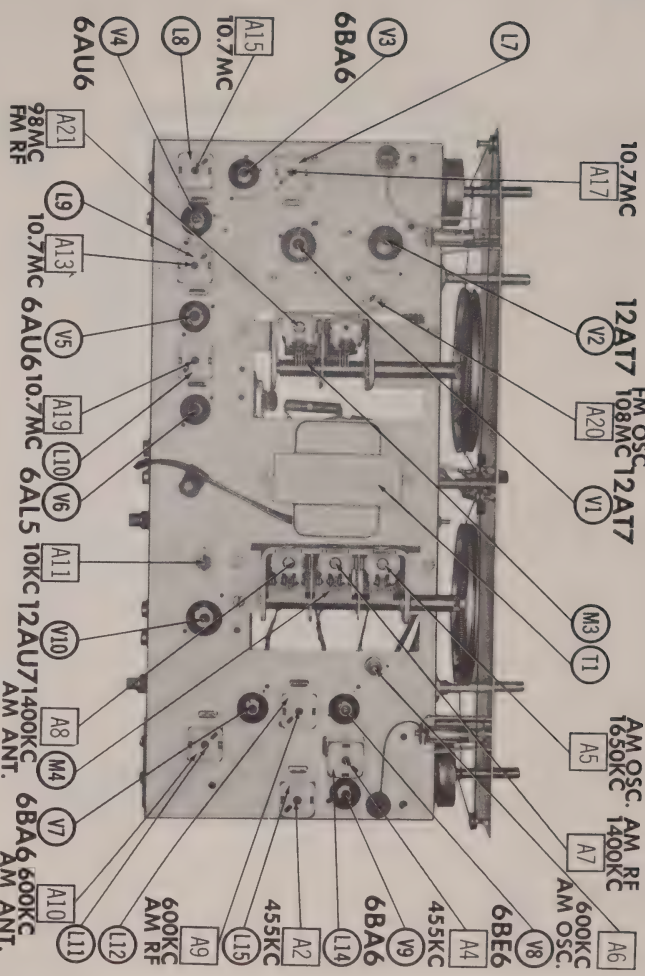
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
① Some versions may use 40-40-40mfd in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C3	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C4	1000 10%		DI-1000	DD-102	5R5D1	CCD-102	GP210	10TS-D10
C5	2 NPO		NPO-DI 2.2	DTZ-2R2	C10V2C	CCTO-2R2	CNO-522	10TCC-V22
C6	1-10			829-10				
C7	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	10 N750		N750-DI 10	DTN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C13	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C24	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C25	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C26	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C27	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C28	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C29	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C32	10000		BPD-01	DD-103	BYA10D1	CCD-103	B-110	5HK-S10
C33	5000		BPD-05	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C34	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C35	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C37	270		DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27
C38	270		DI-270	DD-271	L10T27	CCD-271	B-327	10TS-T27
C39	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C41	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C42	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50
C43	10000 10%		DI-10000		PM4S1	CCD-103	GEM-1611	10TS-S10
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S50

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARKAY PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	½		B-75	A47-2meg-S	Q11-139	U56	AFC
B	Shaft			Not Req.	RS-3	Not Req.	Not Req.	
R2A	1meg	½		BX-69	B47-1meg-S	B11-137	SU-54	FM Level
B	Shaft			Not Req.	Not Req.	SK6	Not Req.	
R3A	1meg	½		BX-69	B47-1meg-S	B11-137	SU-54	AM Level
B	Shaft			Not Req.	Not Req.	SK6	Not Req.	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	68Ω	
R5	4.7meg	
R6	1000Ω	
R7	10K	
R8	1000Ω	
R9	270K	
R10	150Ω	
R11	560Ω	
R12	1000Ω	
R13	68Ω	
R14	1000Ω	
R15	150Ω	(68Ω) *

ITEM No.	RATING	REMARKS
R16	100K	
R17	15K	
R18	47K	
R19	100K	
R20	100K	
R21	68K	
R22	1meg	
R23	100K	
R24	47K	
R25	1000Ω	
R26	22K	
R27	1000Ω	

ITEM No.	RATING	REMARKS
R28	220Ω	
R29	3.3meg	
R30	100K	
R31	1meg	
R32	1000Ω	
R33	10K	
R34	1meg	
R35	1000Ω	
R36	10K	
R37	3300Ω	
R38	330Ω 2W	
R39	330Ω 2W	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ARKAY PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	FM Ant. Coil		BC-561	4602		RTC-8515	1uh ①
L2	RF Coil		BC-561	4602		RTC-8515	1uh ①
L3	FM RF Coil						
L4	FM Osc. Coil						
L5	Cathode Choke		BC-561	4602		RTC-8515	1uh ①
L6	RF Choke		BC-561	4602		RTC-8515	1uh ①
L7	1st FM IF Trans.		FM-254	1463		RTC-8599	
L8	2nd FM IF Trans.		FM-254	1463		RTC-8599	
L9	3rd FM IF Trans.		FM-254	1463		RTC-8599	
L10	Discriminator		FM-253	1464		RTC-8665	
L11	AM Ant. Trans.		BC-380 †	A-5495-A †		RTC-8733 †	
L12	AM RF Trans.		BC-382 †	A-5495-RF †		RTC-8734 †	
L13	AM Osc. Coil		BC-393	70-OSC		RTC-8647	
L14	1st AM IF Trans.						
L15	2nd AM IF Trans.						
L16	10KC Filter						

① IRC Part #CLA.
† Fabricate Mounting.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	ARKAY PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V Ⓐ .51A	135V Ⓐ .070A	6.3V Ⓐ 3.1A							

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	ARKAY PART No.	ITT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.070A		1235AH *	1N1764 ♦	100A *	SR200 ♦	* Selenium Type ♦ Silicon Type

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ARKAY PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	AM Det. (Pigtail)

MISCELLANEOUS

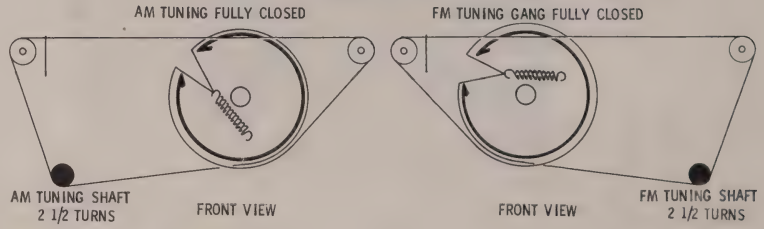
ITEM No.	PART NAME	ARKAY PART No.	NOTES
M3	Tuning Cap.		FM
M4	Tuning Cap.		AM, 3 Gang (Ant, 16-465mmf, RF 14-465mmf, Osc. 22-168mmf)
M5	Switch		Function (DP, 3 Position, Slide Type)
M6	Switch		AC-Off- 3KC-8KC (Rotary Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

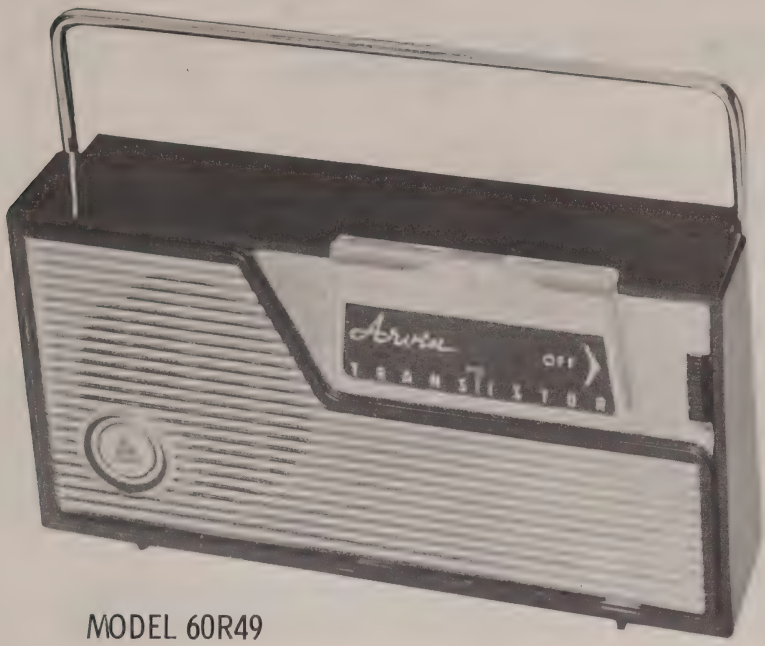
DIAL CORD STRINGING



PHOTOFACT® Folder with CIRCUITRACE®

ARVIN MODELS 60R47, 60R49 (Ch. 1.50401)

ARVIN MODELS 60R47, 60R49 (Ch. 1.50401)



MODEL 60R49

ARVIN MODELS 60R47, 60R49 (Ch. 1.50401)

TRADE NAME	Arvin Models 60R47, 60R49 (Ch. 1.50401)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC
RATING	7MA@6 Volts DC (No Signal, Min. Volume)
	12MA@6 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 — 1670KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1, A2, A3,... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989, WALSCO #2515, 2531, 2532
A4, A5..... GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538
A6..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

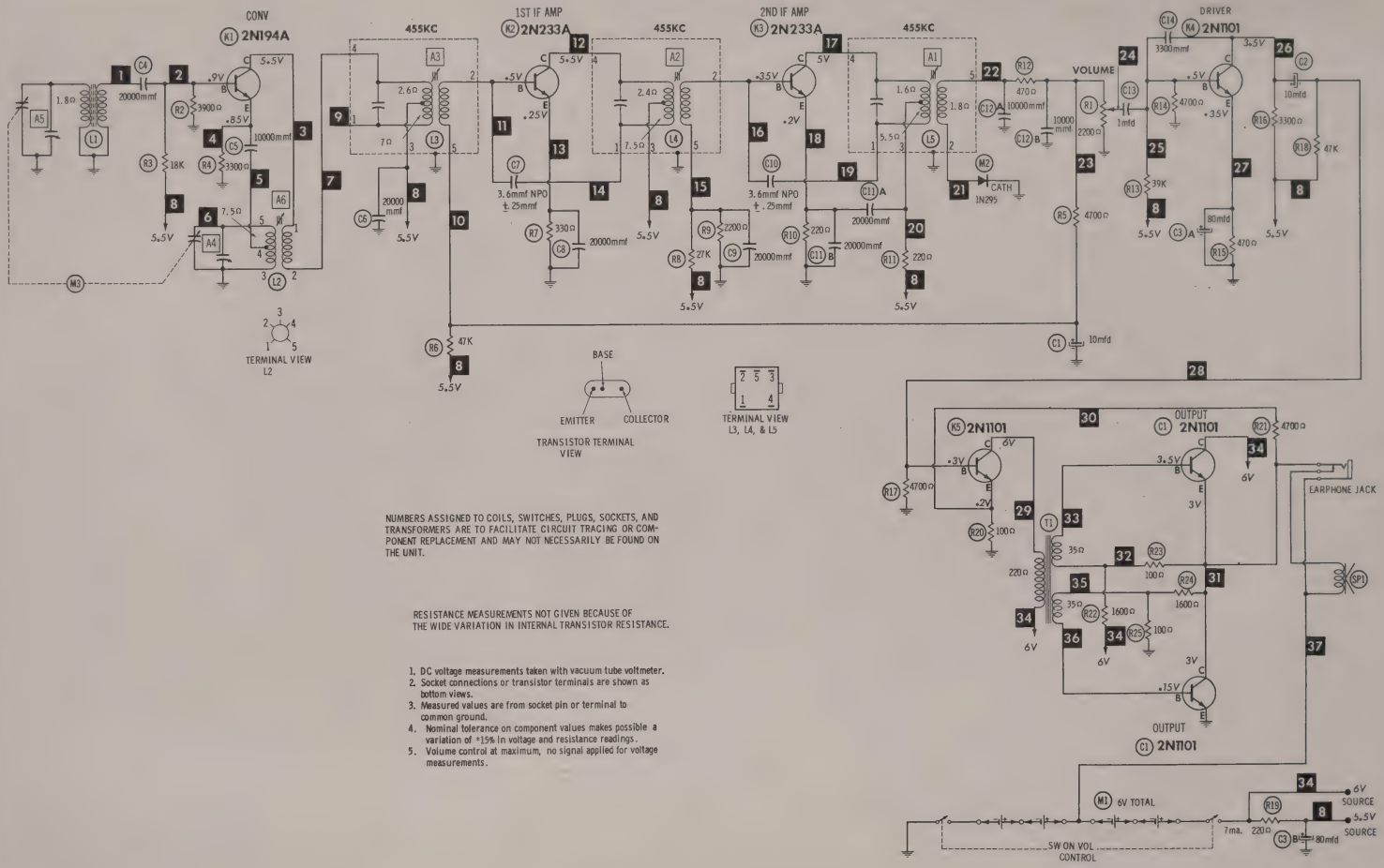
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .05mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.	Loop	1670KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC Signal.	"	A5	"
4.	"	600KC	600KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF170

SET 506 FOLDER 6



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

©Howard W. Sams & Co., Inc. 1960

ARVIN MODELS 60R47, 60R49 (Ch. 1.50401)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N194A	Converter		2N1366	2N194	NPN
X2	2N233A	1st IF Amplifier		2N1367	2N233A	NPN
X3	2N233A	2nd IF Amplifier		2N1367	2N233A	NPN
X4	2N1101	AF Amplifier	2N649		2N1101	NPN
X5	2N1101	Driver	2N649		2N1101	NPN
X6	2N1101	Output	2N649		2N1101	NPN } Matched
X7	2N1101	Output	2N649		2N1101	NPN } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	ARVIN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	10	44396-4	PTT10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C2	10	10	44396-4	PTT10010	NLW10-10	TT12X10	ML10-15	TE-1114	
C3A	80	12	44397-4	BCD10X8080	ECPAN14	TT15X100		VL-2350	
B	80	12	}			TT15X100			

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C7	3.6 NPO ± .25mmf							
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C10	3.6 NPO ± .25mmf							
C11A	20000		BPD-2X02	DD-203	BYB6S2	CCD-203	B-120	5HK-2XS20
B	20000			DD-203	BYB6S2	CCD-203	B-120	
C12A	10000		BPD-2X01	DD3-103	BYD6DS1	CCD-103	B2X110	5HK-2XS1
B	10000					CCD-103		
C13	1mfd 3V	#44684-9		UK-105				HY-135
C14	3300		BPD-0033		BYA10D33	CCD-332	B-233	5HK-D33

Arvin Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2200Ω	1/4	46800-4					Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

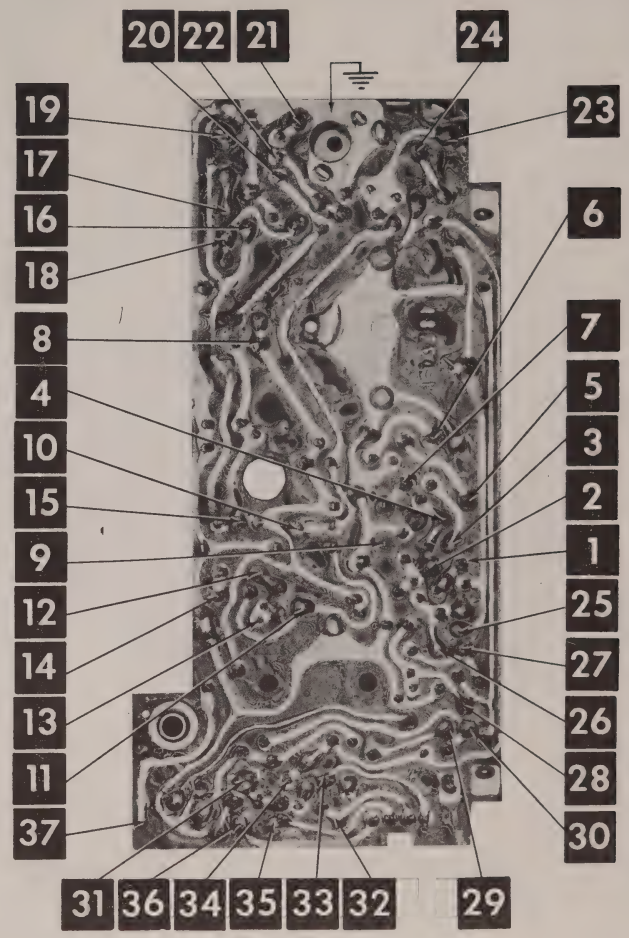
ITEM No.	RATING	REMARKS
R2	3900Ω	
R3	18K	
R4	3300Ω	
R5	4700Ω	
R6	47K	
R7	330Ω	
R8	27K	
R9	2200Ω	

ITEM No.	RATING	REMARKS
R10	220Ω	
R11	220Ω	
R12	470Ω	
R13	39K	
R14	4700Ω	
R15	470Ω	
R16	3300Ω	
R17	4700Ω	

ITEM No.	RATING	REMARKS
R18	47K	
R19	220Ω	
R20	100Ω	
R21	4700Ω	
R22	1600Ω	
R23	100Ω	
R24	1600Ω	
R25	100Ω	

PRINTED BOARD

A Howard W. Sams CIRCUITRACE Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		ARVIN PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	44511-6					
L2	Osc. Coil	45783-12					
L3	1st IF Trans.	47163-1					
L4	2nd IF Trans.	47163-2					
L5	3rd IF Trans.	47163-3					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	ARVIN PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	3.8	1 SEC. 2	45604-6					
	3.8	1						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	QUAM PART No.	
SP1	2 3/4"	PM	48. 9Ω	44280-2		

BATTERIES

ITEM No.	VOLTAGE	ARVIN PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V								4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		ARVIN PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N295	43959	1N295	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M3	Tuning Cap. Printed Board	47431 48264-1	2 Gang

CABINETS & CABINET PARTS

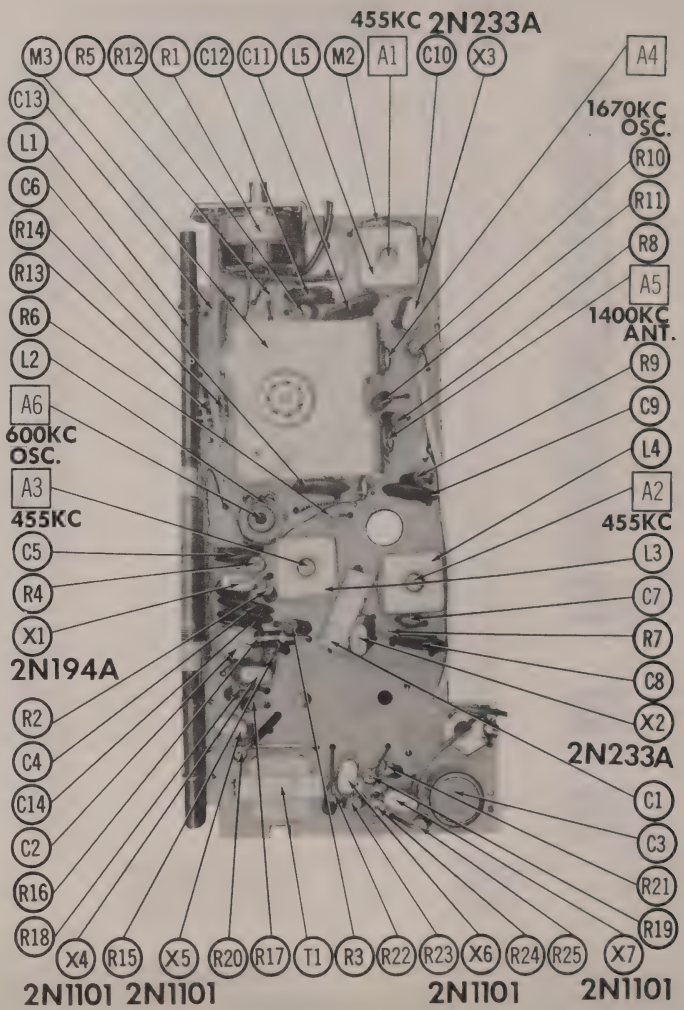
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	47132-29	Tuning, Black
Knob	47132-67	Tuning, White
Knob	46658-29	Volume, Black
Knob	46658-67	Volume, White
Cabinet	46921-29	Back, Black
Cabinet	46921-67	Back, White
Cabinet	48272	Front
Handle	46923-1	Chrome

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

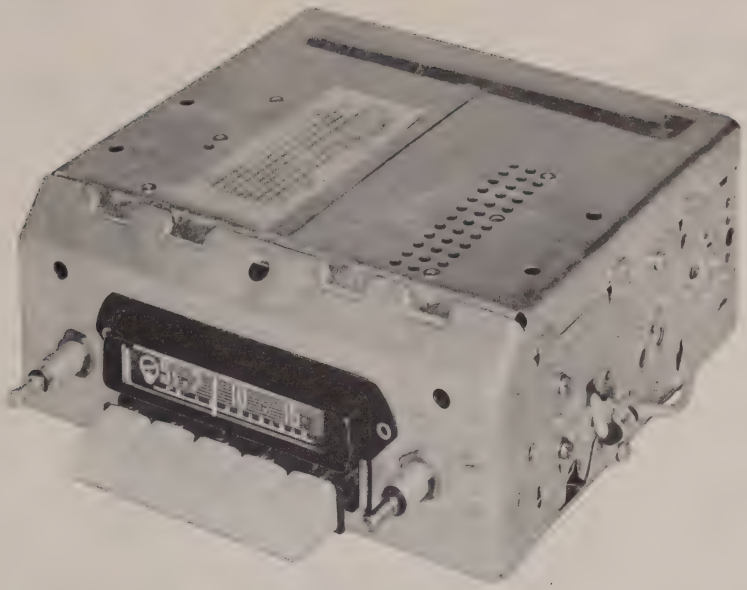
CHASSIS—TOP VIEW



PHOTOFACT® Folder

BLAUPUNKT
MODEL 3598

BLAUPUNKT
MODEL 3598



BLAUPUNKT
MODEL 3598

TRADE NAME	Blaupunkt Model 3598 (Serial #Q180001 And Up)
IMPORTER	Robert Bosch Corp., 40-25 Crescent Street, Long Island City 1, N. Y.
TYPE SET	Battery Operated 4 Tube, 3 Transistor Universal Type Automobile AM Receiver
POWER SUPPLY	Storage Battery (6 or 12 Volt) RATING 1.2 Amp. @ 12.6 Volts DC (or)
TUNING RANGE—BROADCAST	519 — 1630KC 1.6 Amp. @ 6.3 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4, A8, A9, A10...GENERAL CEMENT #5004, 5009, 8195, 8274, 8275, 8607, 8728, 8987, 8988, 8989, 9291
WALSCO #2515, 2520, 2522, 2523, 2531, 2532, 2534, 2537, 2538

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Thru dummy (Fig. 1) to antenna receptacle.	460KC (400∿ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1100KC	1100KC	"	A5, A6, A7	"
3.	"	519KC	Low end stop.	"	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 600KC and adjust A10 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat for remaining pushbuttons.

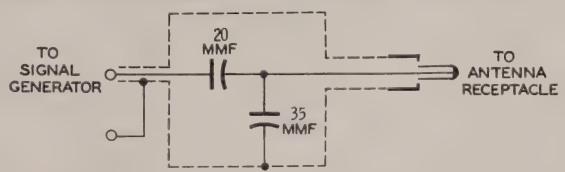


FIG. 1

SET 506 FOLDER 7

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD088

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC •			RAYTHEON •		SYLVANIA •	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	EF89	V3	IF Amp. -Det. -AVC	EBF89
V2	Mixer-Osc.	ECH81	V4	AF Amp. -Driver	ECF83

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	TF80/30	Output				PNP
X2	TF80/30	Output				PNP
X3	TF77/30	Power Osc.				PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	BLAUPUNKT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	15		PRS1200	BBRI00-15	TC2501	ML100-15	TVA-1160	
C2	50	15		XPP-15050	NLW50-15	TT15X50	ML50-15	TE-1160	
C3	10	12		XPP-12010	NLW10-15	TT12X10	ML10-15	TE-1128	
C4	4	150		SRE150V5	NLW4-150	TT150X4	ML4-150	TE-1503	
C5	2	100			NLW2-100	TT150X2	ML2-100	TE-1401	
C6	4	150		SRE150V5	NLW4-150	TT150X4	ML4-150	TE-1503	
C7	.5	100			NLW1-150	TT150X1	ML1-100	TE-1400	
C8	2	100			NLW2-100	TT150X2	ML2-100	TE-1401	
C9	25	6		XPP-6025	NLW25-10	TT6X25	ML30-6	TE-1091	

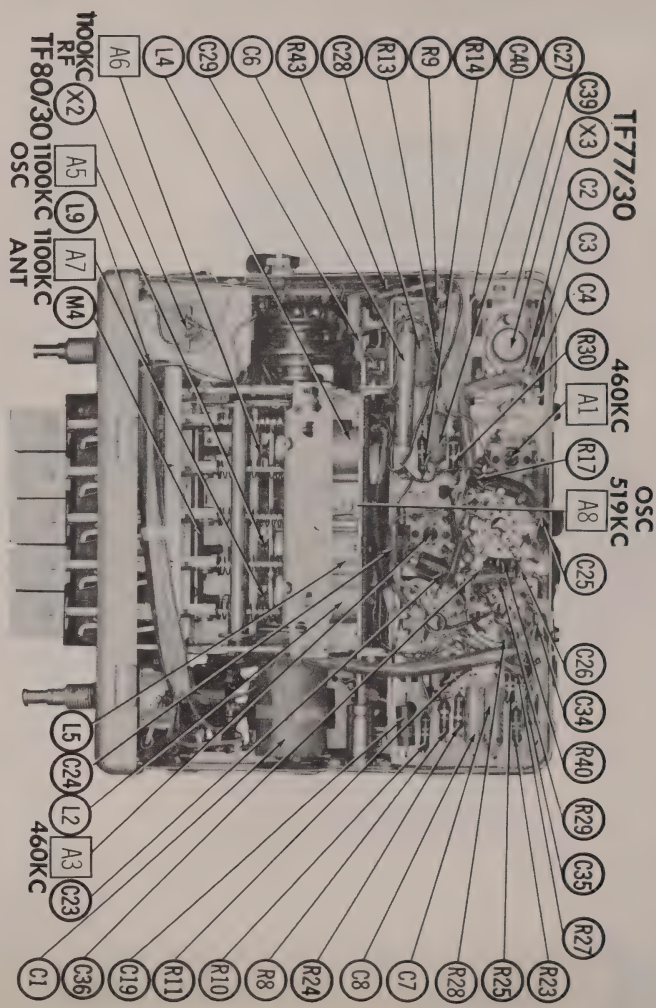
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C10	10-60					404		
C11	50 N150					*		10TCP-Q47
C12	70 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C13	50 N750		N750-SI 50	TCN-50	C10Q5U	CCTN-470	CN7-447	10TCU-Q47
C14	.05 250V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C15	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C16	20 N750		N750-SI 20	TCN-20	C10Q2U	CCTN-220	CN7-420	10TCU-Q20
C17	500		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C18	10-60					404		
C19	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM 411	4TM-S1
C20	480		SI 470	D6-471	BYA10T47	CCD-471	B-347	10TS-T47
C21	500 2.5%					VCM-20-501G	MCE445	
C22	300 2.5%					VCM-20-301G	MCE241	
C23	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C24	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C25	20 N150					*		10TCP-Q22
C26	.02 150V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C27	.01 500V		P688N-01	D6-103	CUB6S1	6DP-2-103	GEM-611	6TM-S1
C28	.005 500V		P688N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C29	90 N750		N750-SI 91	TCN-91	C10Q91U	CCTN-101	CN7-310	10TCU-T10
C30	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C31	.025 125V		P288N-025		DPMS6S25	4DP-2-253	GEM-4125	4TM-S25
C32	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C33	.04 150V		P288N-04	DD-403	CUB6S4	4DP-3-403	GEM-414	4TM-S4
C34	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C35	2000		SI 2000	D6-202	BYA10D2	CCD-202	B-220	5HK-D20
C36	.001 400V		P488N-001	D6-102	CUB6D1	6DP-1-102	GEM-621	6TM-D1
C37	.005 400V		P488N-005	D6-502	CUB6D5	6DP-1-502	GEM-625	6TM-D5
C38	.025 125V		P288N-025		DPMS6S25	4DP-2-253	GEM-4125	4TM-S25
C39	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C40	5000		SI 5000	D6-502	BYA10D5	CCD-502	B-250	5HK-D50

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	BLAUPUNKT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2						Tone
B	1, 3meg 250K Tap							Volume
C	Switch							Push-Pull Off-On
R2	10Ω	2(WW)						Bias

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	100K	
R4	1meg	
R5	3000Ω	
R6	50K	
R7	100K	
R8	20K	
R9	5000Ω	
R10	50K	
R11	10K	
R12	2meg	
R13	5000Ω	
R14	50K	
R15	1meg	
R16	500K	

ITEM No.	RATING	REMARKS
R17	250K	
R18	100K	
R19	20K	
R20	5meg	
R21	5meg	
R22	5meg	
R23	250K	
R24	500Ω	
R25	700K	
R26	100K	
R27	200K	
R28	2. 5meg	
R29	1. 6meg	
R30	800Ω	

ITEM No.	RATING	REMARKS
R31	10Ω Cold	
R32	30Ω 2W	
R33	30Ω 2W	
R34	80Ω 1W	
R35	50Ω	
R36	1000Ω	
R37	500Ω	
R38	500Ω	
R39	5000Ω	
R40	500Ω	
R41	0. 25Ω	
R42	0. 25Ω	
R43	50Ω	

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		BLAUPUNKT PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	RF Choke						
L2	Ant. Coil						
L3	RF Choke						
L4	RF Coil						
L5	Osc. Coil						
L6	1st IF Trans.						
L7	2nd IF Trans.						
L8	RF Choke						
L9	"A" Lead Hash Choke						

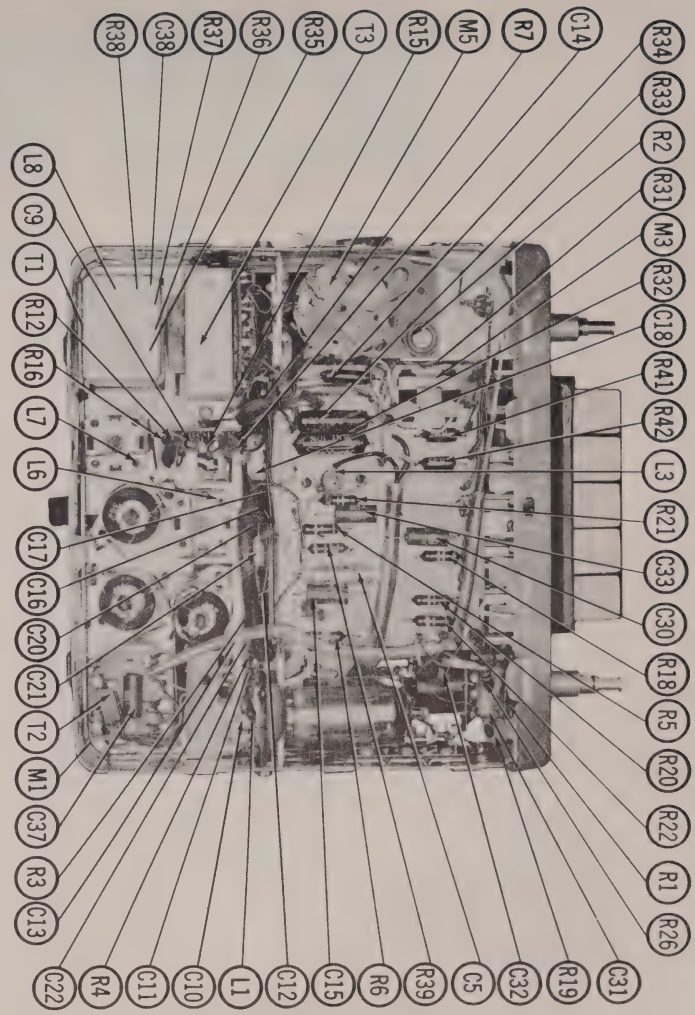
TRANSFORMER (POWER OSC)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	INPUT	OUTPUT	SEC. 2	BLAUPUNKT PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	12. 6V @ . 350A	70 VDC @ . 010A								

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	BLAUPUNKT PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2.6	1						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	REPLACEMENT DATA BLAUPUNKT PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	100Ω CT Tap ⓐ 200Ω CT Tap ⓐ 10Ω CT Tap ⓐ 5Ω CT							

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BLAUPUNKT PART No.	ITT ♦ PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.010A	*	RE504 ♦	1N1763 ♦	2F4 ♦	SR200 ♦	* Selenium Type ♦ Silicon Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA BLAUPUNKT PART No. FUSE	HOLDER	LITTELFUSE PART No. FUSE	HOLDER	BUSS PART No. FUSE	HOLDER
M2 M3		4A 1.6A						

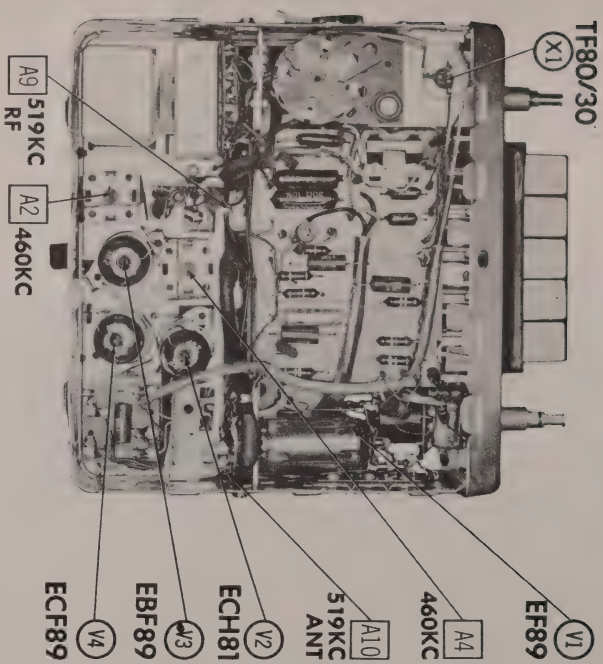
MISCELLANEOUS

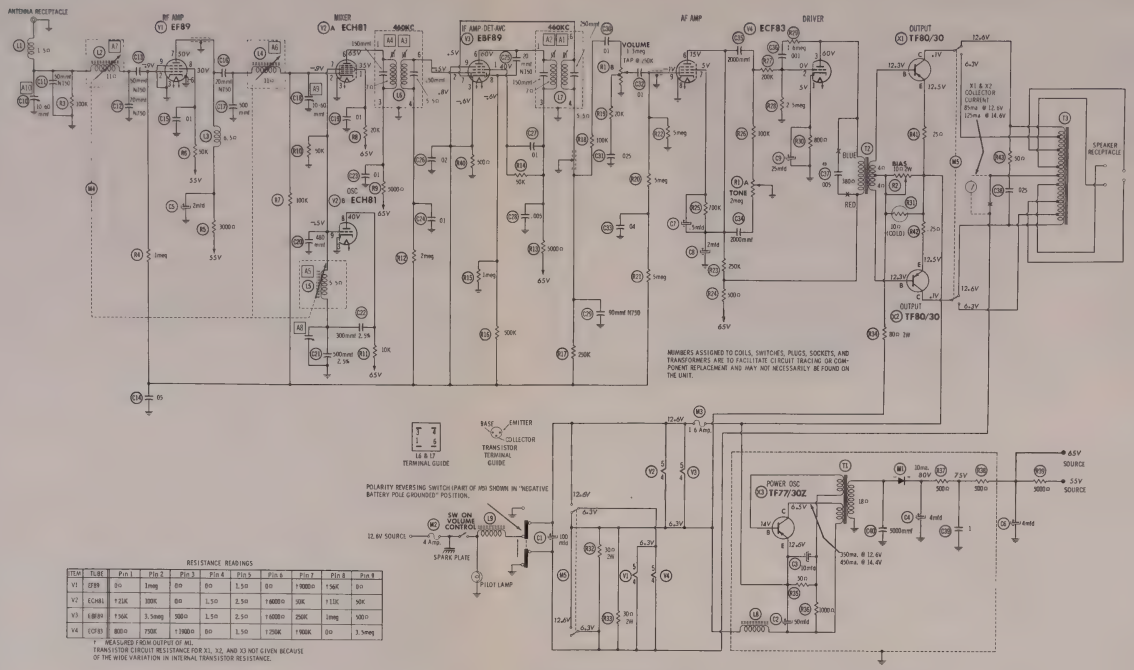
ITEM No.	PART NAME	BLAUPUNKT PART No.	NOTES
M4	Tuner		Complete
M5	Switch		Voltage Selector (Includes Polarity Reversing Switch)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

CHASSIS—TOP VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EF89	0Ω	1meg	0Ω	0Ω	1.5Ω	0Ω	†900Ω	†5K	0Ω
V2	ECH81	†2K	300K	0Ω	1.5Ω	2.5Ω	†600Ω	50K	†15K	50K
V3	EBF89	†5K	3.5meg	500Ω	1.5Ω	2.5Ω	†600Ω	250K	1meg	500Ω
V4	ECF83	800Ω	750K	†390Ω	0Ω	1.5Ω	†250K	†900K	0Ω	3.5meg

† MEASURED FROM OUTPUT OF M1.
TRANSISTOR CIRCUIT RESISTANCE FOR X1, X2, AND X3 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960

BLAUPUNKT
MODEL 3598

PHOTOFACT® Folder

**CAPITOL
MODEL 935**

CAPITOL
MODEL 935

CAPITOL
MODEL 935

TRADE NAME	Capitol Model 935
MANUFACTURER	Capitol Records, Inc., 1 S. Webster Ave., Scranton 5, Pa.
TYPE SET	AC Operated 7 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 100 Watts, .96 Amp. @ 117 Volts AC (Less Motor)

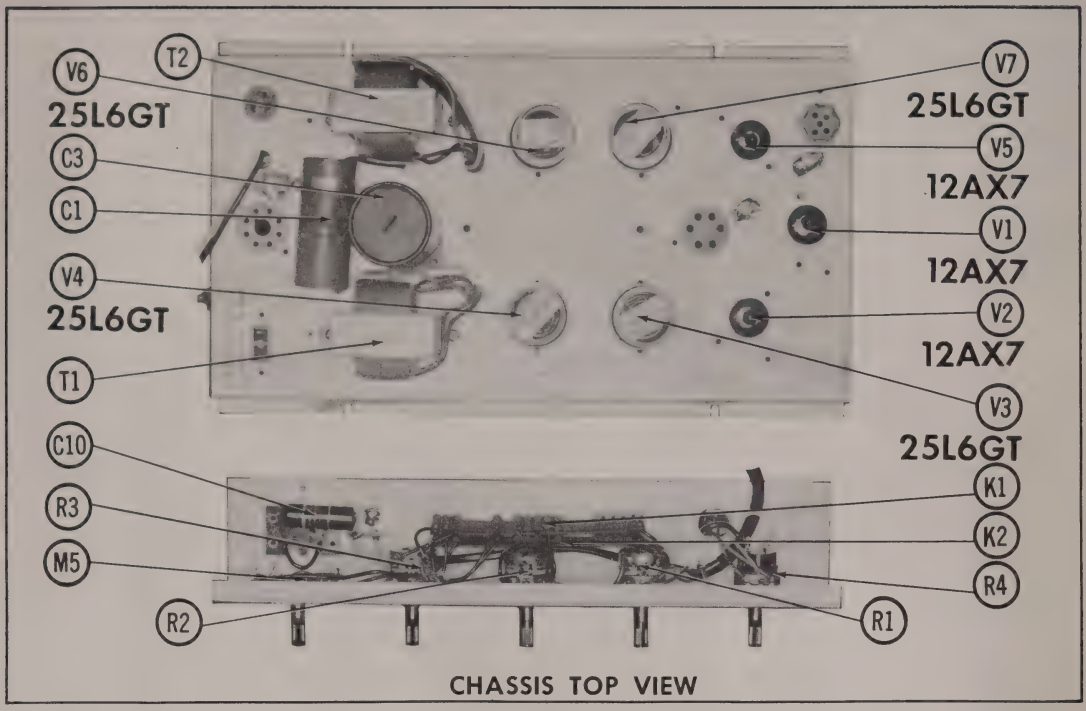
FOR SERVICE INFORMATION ON RECORD CHANGER — SEE V-M 1201 — PHOTOFACT SET 436 FOLDER 18
OR RECORD CHANGER MANUAL RC-12

SET 506 FOLDER 8

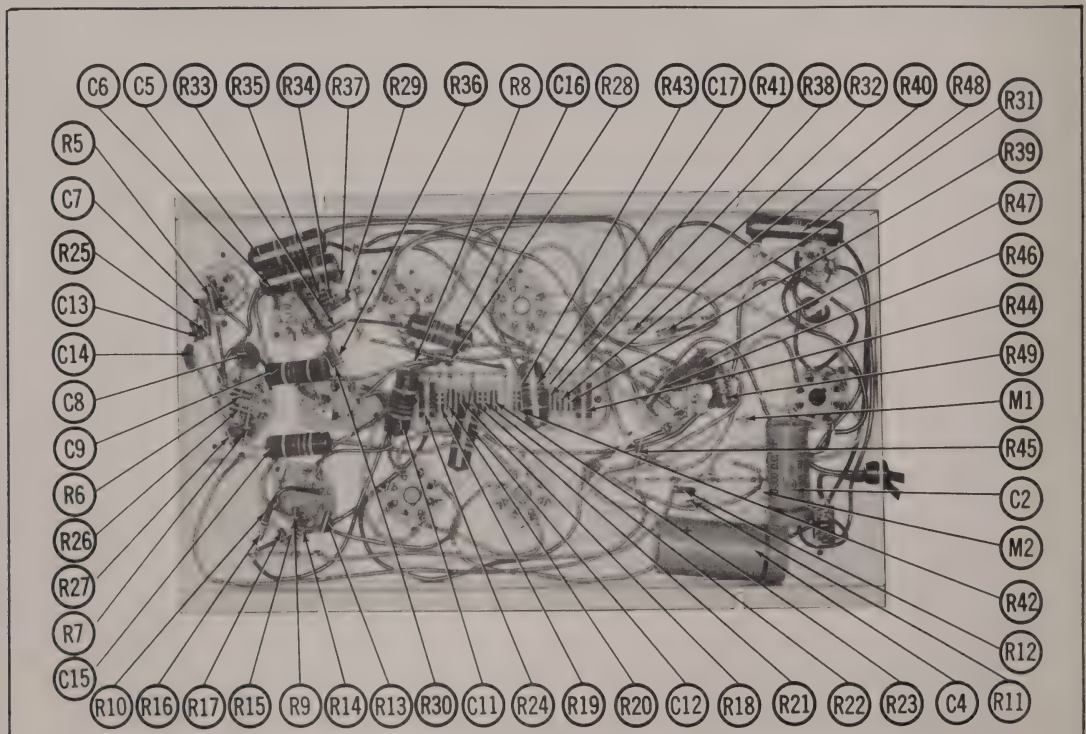
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

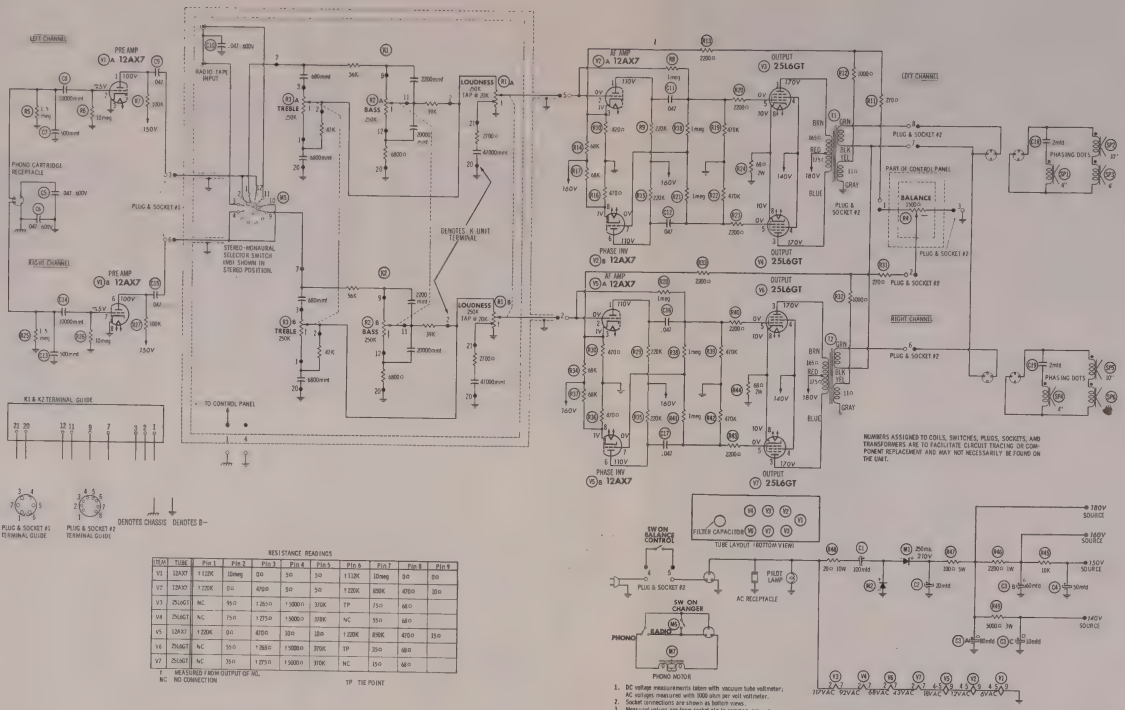
KT163



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†220K	10meg	0Ω	3Ω	5Ω	†112K	10meg	3Ω	0Ω
V2	12AX7	†220K	0Ω	470Ω	5Ω	5Ω	†220K	106K	470Ω	33Ω
V3	2SL6GT	NC	95Ω	†265Ω	†300Ω	370K	TP	75Ω	66Ω	
V4	2SL6GT	NC	75Ω	†275Ω	†300Ω	378K	NC	55Ω	66Ω	
V5	12AX7	†220K	0Ω	470Ω	33Ω	12Ω	†220K	89K	470Ω	15Ω
V6	2SL6GT	NC	55Ω	†265Ω	†300Ω	370K	TP	35Ω	66Ω	
V7	2SL6GT	NC	35Ω	†275Ω	†300Ω	370K	NC	15Ω	66Ω	

† MEASURED FROM OUTPUT OF VOL.
NC NO CONNECTION
TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured with 1000 ohm per volt voltmeter.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common ground.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
7. All controls at minimum, proper output load connected.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

CAPITOL MODEL 935

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel Preamp. - Right Channel Preamp.	12AX7	V4	Left Channel Output	25L6GT
V2	Left Channel AF Amp. - Phase Inverter	12AX7	V5	Right Channel AF Amp. - Phase Inverter	12AX7
V3	Left Channel Output	25L6GT	V6	Right Channel Output	25L6GT
			V7	Right Channel Output	25L6GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	CAPITOL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	100	250	150-003	PRS1595	BR10035	TC1265	TD-100-450	TVA-1718	
C2	20	300	150-002	PRS1735	BR2035	TC65	TD-20-350	TVA-1608	
C3A	▬80	300	160-001	AFH3-45-50	B0350	FP425.1	TMD-2490	TVL-2672	
B	▲60	300			BR6035		TD-60-350	TVA-1613	
C	■10	300							
C4	50	250	150-001	PRS1585	BR5025	TC59	TD-50-450	TVA-1713	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C6	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C7	500		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C10	.047 600V		P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47
C11	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C12	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C13	500		SI 500	D6-501	BYA10T5	CCD-501	B-350	10TS-T50
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C17	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C18	2mfd 50V		P123ZNN-2.0		MP2W2			
C19	2mfd 50V		P123ZNN-2.0		MP2W2			

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CAPITOL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	250K 20K Tap	½	132-136					Loudness, Right Channel
B	250K 20K Tap	½						Loudness, Left Channel
R2A	250K	½	133-551	B-51	AD47-250K-2		FA254A	Bass, Right Channel
B	250K	½		SR-51	Not Req.		RU254A	Bass, Left Channel
C	Shaft			Not Req.	KSS-3		C83500	
R3A	250K	½	133-551	B-51	AD47-250K-2		FA254A	Treble, Right Channel
B	250K	½		SR-51	Not Req.		RU254A	Treble, Left Channel
C	Shaft			Not Req.	KSS-3		C83500	
R4A	1500Ω	½	133-552			Bil-109		Balance
B	Switch					SK7		Power Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	1.5meg	
R6	10meg	
R7	100K	
R8	1meg	
R9	220K	
R10	470Ω	
R11	270Ω	
R12	1000Ω	
R13	2200Ω	
R14	68K	
R15	220K	
R16	470Ω	
R17	68K	
R18	1meg	
R19	470K	

ITEM No.	RATING	REMARKS
R20	2200Ω	
R21	1meg	
R22	470K	
R23	2200Ω	
R24	68Ω 2W	
R25	1.5meg	
R26	10meg	
R27	100K	
R28	1meg	
R29	220K	
R30	470Ω	
R31	270Ω	
R32	1000Ω	
R33	2200Ω	
R34	68K	

ITEM No.	RATING	REMARKS
R35	220K	
R36	470Ω	
R37	68K	
R38	1meg	
R39	470K	
R40	2200Ω	
R41	1meg	
R42	470K	
R43	2200Ω	
R44	68Ω 2W	
R45	10K	
R46	2200Ω 1W	
R47	100Ω 5W	IRC#PW5-100Ω
R48	20Ω 10W	IRC#PW10-20Ω
R49	5000Ω 3W	IRC#PW3-5000Ω

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CAPITOL PART No.	REPLACEMENT DATA
K1	Tone Comp.	680mmf, 2200mmf, 6800mmf, 20000mmf, 47000mmf, 2700Ω, 6800Ω, 39K, 47K, 56K	3985-209	
K2	Tone Comp.	680mmf, 2200mmf, 6800mmf, 20000mmf, 47000mmf, 2700Ω, 6800Ω, 39K, 47K, 56K	3985-209	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.[1]	CAPITOL PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	6700Ω CT	6-8Ω	210-003						
		SEC. 2							
		30Ω							
		SEC. 1							
T2	6700Ω CT	6-8Ω	210-003						
		30Ω							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CAPITOL PART No.	QUAM PART No.	
SP1	10"	PM	3-4Ω	229-010	10A6A	
SP2	6"	PM	3-4Ω	229-009	6A15	
SP3	4"	PM	6-8Ω	229-008	4A1Z6.4	
SP4	10"	PM	3-4Ω	229-010	10A6A	
SP5	6"	PM	3-4Ω	229-009	6A15	
SP6	4"	PM	6-8Ω	229-008	4A1Z6.4	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	CAPITOL PART No.	ITT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.250A	250-002	RE504	1N1764	F6	SR500	
M2	.250A	250-002	RE504	1N1764	F6	SR500	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	CAPITOL PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M3	18615-B	13TX		13		A-44XDD		10T2-SD	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA		REMARKS
	CAPITOL PART No.	JENSEN PART No.	
M4	(Part of M3)	A-44X † or A-44XSD †♦ or A-44XDD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	CAPITOL PART No.	NOTES
M5	Switch	240-001	Function Selector
M6	Switch	467	Off-On (Part of Changer)
M7	Motor Assembly	18361	Complete, (Includes Motor Part# 9134)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	305-012	
Knob	305-013	With Spring
Cabinet	300-935W	Walnut
Cabinet	300-935M	Mahogany
Cabinet	300-935SW	Speaker, Walnut
Cabinet	300-935SM	Speaker, Mahogany

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

COLUMBIA MODELS
C1164B, M, W

COLUMBIA MODELS
C1164B, M, W

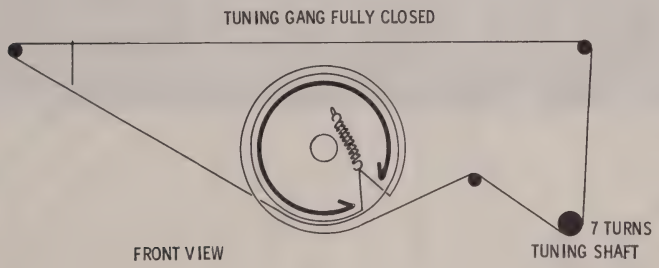
MODEL C1164M

COLUMBIA MODELS
C1164B, M, W

TRADE NAME	Columbia Models C1164B, C1164M, C1164W		
MANUFACTURER	CBS Electronics, 100 Endicott Street, Danvers, Mass		
TYPE SET	AC Operated 12 Tube FM-AM Receiver With Stereo Amplifier And 4 Speed Automatic Record Changer		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	105 Watts, .9 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 — 1620KC	FM	88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR GLASER-STEERS GS-77 (REVISED) — PHOTOFACT SET 482 FOLDER 11

DIAL CORD STRINGING

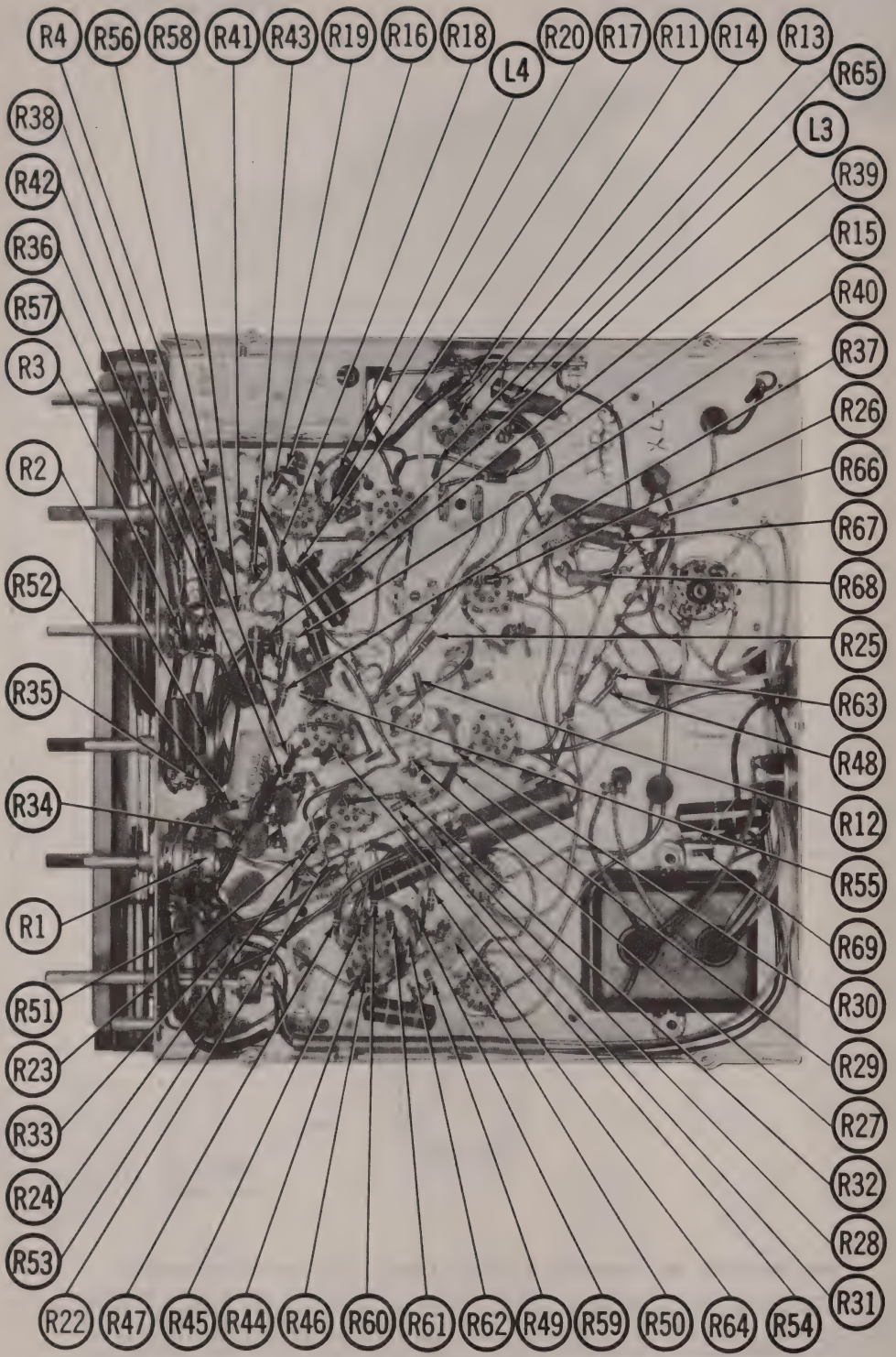


HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

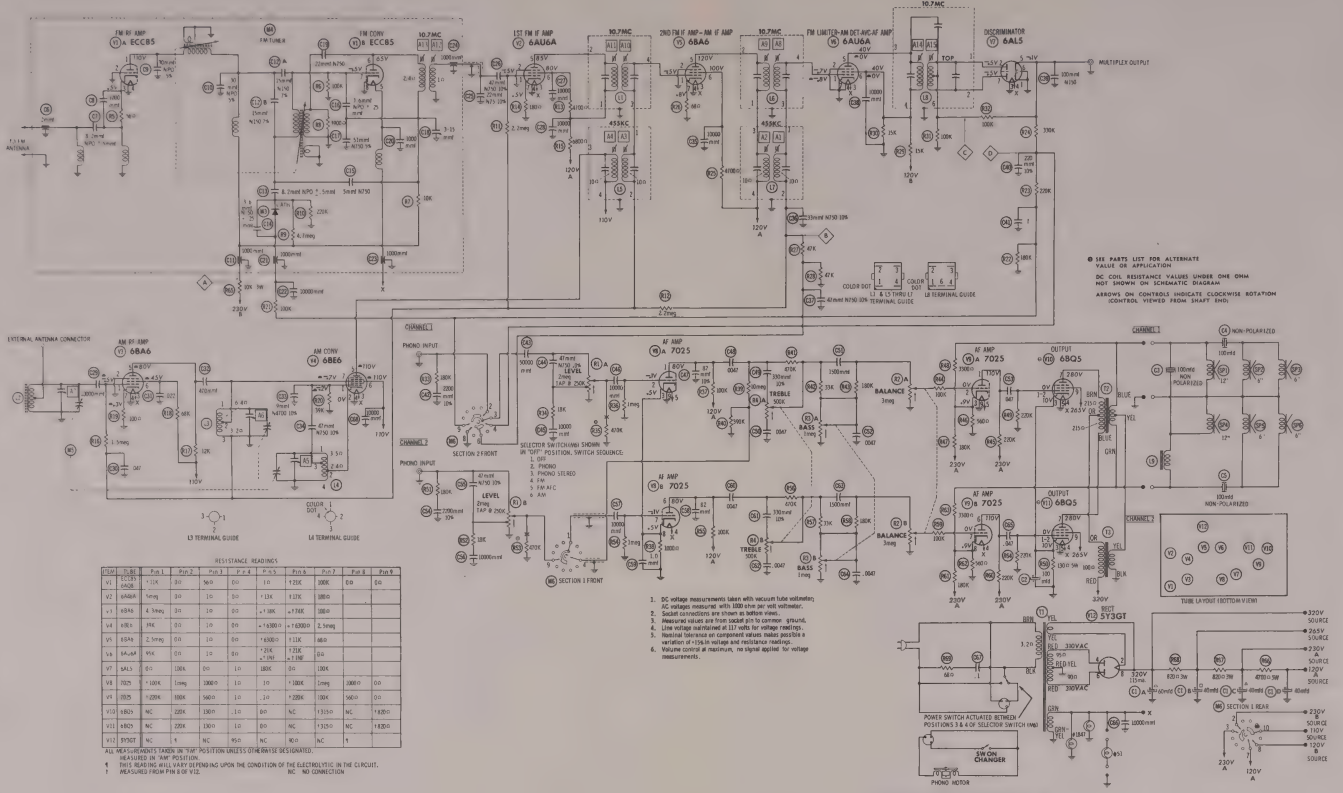
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KN090

SET 506 FOLDER 9



CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6CB5 / 6AQ8	115K	0.0	560	0.0	1.0	125K	100K	0.0	0.0
V2	6AB4	54meg	0.0	1.0	0.0	1.3K	1.3K	1.3K		
V3	6BA6	4.1meg	0.0	1.0	0.0	1.18K	1.74K	1.18K		
V4	6BE6	1MK	0.0	1.0	0.0	1.63000	1.63000	2.5meg		
V5	6BA6	2.5meg	0.0	1.0	0.0	1.63000	1.11K	660		
V6	6AU6A	99K	0.0	1.0	0.0	1.21K 2.1M	1.21K 2.1M	0.0		
V7	6AL5	0.0	120K	0.0	1.0	180K	0.0	120K		
V8	7025	1.00K	1.5meg	1.000	1.0	1.0	1.00K	1.5meg	1.000	0.0
V9	7025	1.220K	100K	560	1.0	1.0	1.220K	100K	560	0.0
V10	6BQ5	NC	220K	1300	1.0	0.0	NC	1.315Ω	NC	1.820
V11	6BQ5	NC	220K	1300	1.0	0.0	NC	1.315Ω	NC	1.820
V12	5Y3GT	NC	1	NC	95Ω	NC	90.0	NC	1	

ALL MEASUREMENTS TAKEN IN "OFF" POSITION UNLESS OTHERWISE DESIGNATED.
MEASURED IN "AM" POSITION.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V12. NC NO CONNECTION

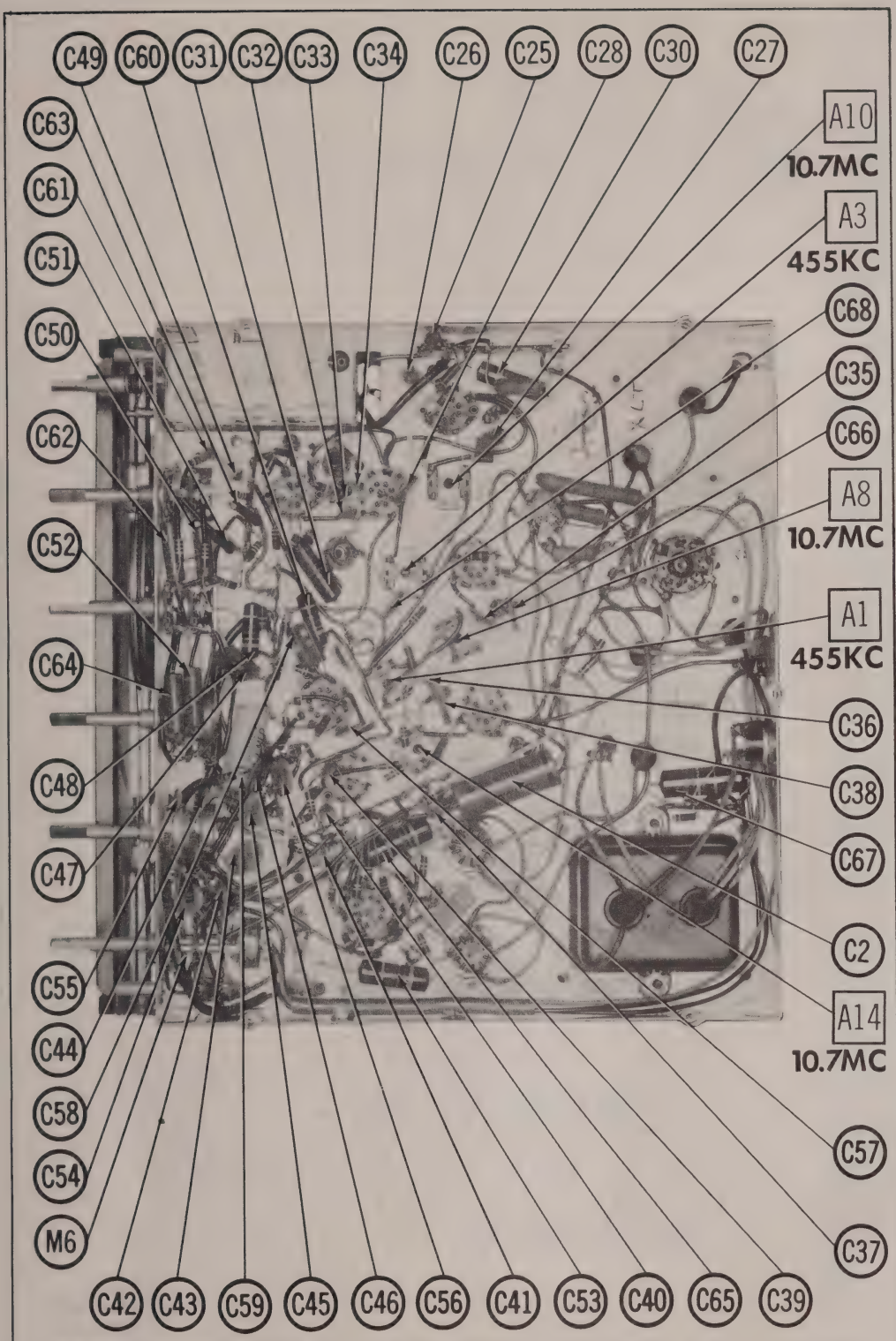
1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured with 1000 ohm per volt voltmeter.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common ground.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerances on component values makes positive a variation of +5% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960

COLUMBIA MODELS
C1164B, M, W



CHASSIS BOTTOM VIEW - ALIGNMENT, CAPACITOR & MISC. IDENT.

COLUMBIA
MODEL C1164B

FOLDER 9

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Level control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1, A2, A3, A4..... GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A5, A6, A7..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A8, A9, A10, A11, A14, A15 GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545

A12, A13..... GENERAL CEMENT #9296, 9297
WALSCO #2546, 2547

AM ALIGNMENT—SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	High side thru 470Ω to external AM Antenna terminal. Low side to chassis.	1620KC	"	"	A5	"
3.	"	1400KC	1400KC Signal.	"	A6, A7	Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	High side thru .01mfd to point Ⓐ. Low side to chassis.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓑ. Common to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum deflection.
5.	"	"	"	DC probe thru 1meg to point Ⓒ. Common to chassis.	A14	"
6.	"	"	"	DC probe to point Ⓓ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	High side thru .01mfd to point Ⓐ. Common to chassis.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. Amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown.
5.	"	"	"	Vert. Amp. thru 27K to point Ⓒ. Low side to chassis.	A14	"
6.	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of cross-over lines.

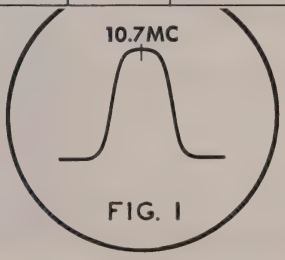


FIG. 1

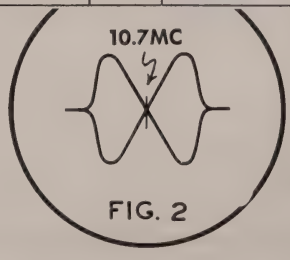
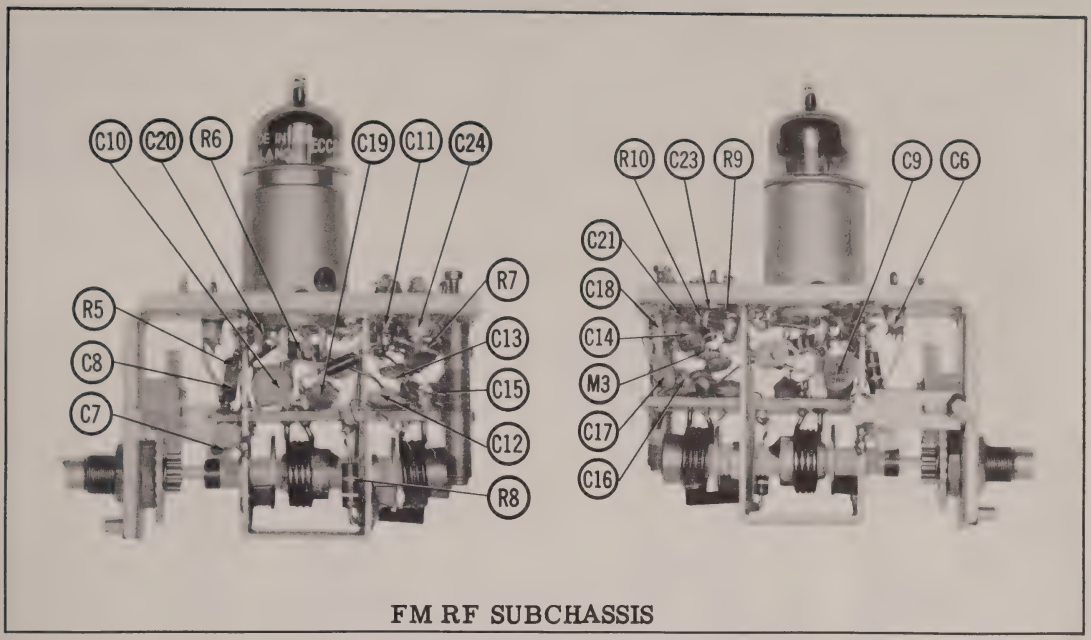
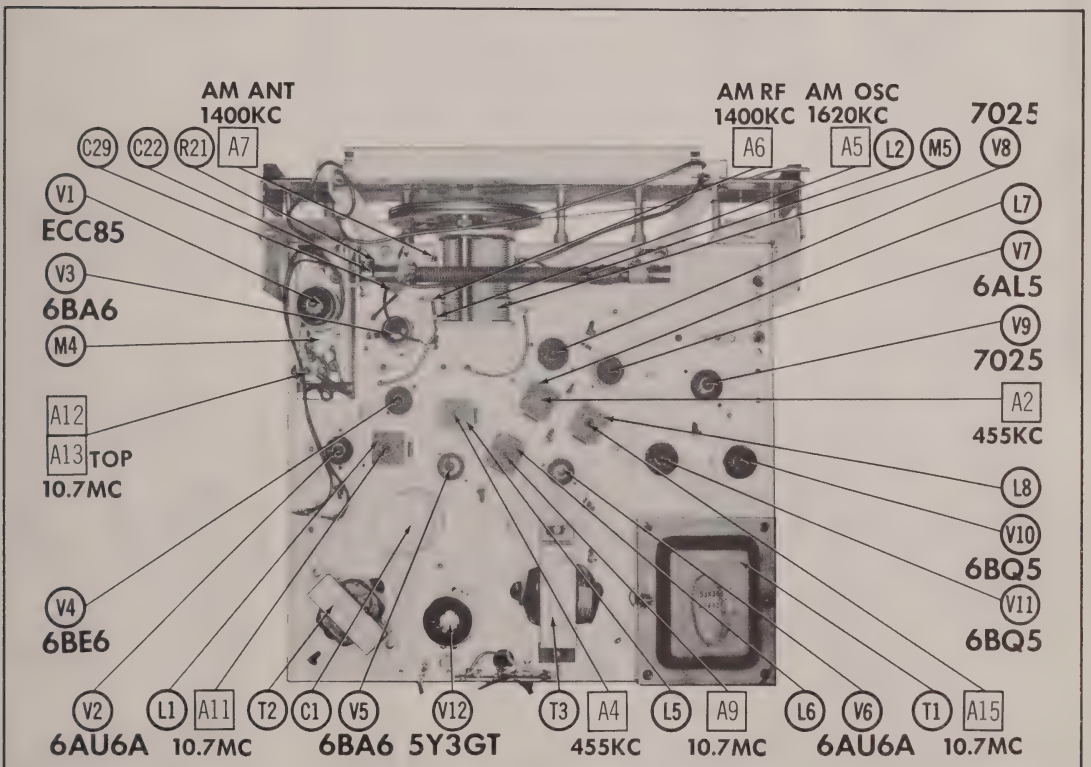


FIG. 2



FM RF SUBCHASSIS



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	ECC85/6AQ8
V2	FM IF Amplifier	6AU6A
V3	AM RF Amplifier	6BA6
V4	AM Converter	6BE6
V5	FM IF Amp. -AM IF Amp.	6BA6
V6	FM Limiter-AM Det. -AVC	6AU6A
V7	Discriminator	6AL5
V8	Channel 1 AF Amp. - Channel 2 AF Amp.	7025
V9	Channel 1 AF Amp. - Channel 2 AF Amp.	7025
V10	Channel 1 Output	6BQ5 (EL84) *
V11	Channel 2 Output	6BQ5 (EL84) *
V12	Rectifier	5Y3GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲80	400	11E736	AFH4-18-45	D0674	FP377	TMT-3748	TVL-4739	
B	■40	400			BR4045	TC795	TD-50-450	TVA-1714	
C	▲40	400							
D	40	400							
C2	100	25	11E737	PRS1270	BBR100-25	TC2501	TD-100-25	TVA-1207	
C3	100	50NP			BR10015	TC496 †	TD-100-150	TVANS-1310.1*	
C4	100	50NP			BR10015	TC496 †	TD-100-150	TVANS-1310.1*	
C5	100	50NP			BR10015	TC496 †	TD-100-150	TVANS-1310.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

† Use 2 unit. Connect negative terminals together. Connect positive terminals into circuit the same as the original non-polarized unit.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	2							
C7	8.2 NPO ± .5mmf		NPO-DI 8.2		C10V82C			10TCC-V82
C8	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	30 NPO 5%			TCZ-30	C10Q30C			10TCC-Q30
C10	30 NPO 5%			TCZ-30	C10Q30C			10TCC-Q30
C11	1000		EF-001	MFT-1000		CCF-102	CT280A	
C12A	15 N150 7%					*		10TCP-Q15
B	15 N150 7%					*		10TCP-Q15
C13	8.2 NPO ± .5mmf		NPO-DI 8.2		C10V82C			10TCC-V82
C14	3.6 N750 ± .25mmf							
C15	5 N750			DTN-5	C10V5U	CCTN-050	CN7-550	10TCU-V50

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C16	3.6 NPO ± .25mmf							
C17	51 N750 5%			TCN-51	C10Q51U			
C18	3-15							
C19	22 N750		N750-DI 22	DTN-22	C10Q22U	CCTN-220	CN7-422	10TCU-Q22
C20	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C21	1000		EF-001	MFT-1000		CCF-102	CT280A	
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	1000		EF-001	MFT-1000		CCF-102	CT280A	
C24	1000		EF-001	MFT-1000		CCF-102	CT280A	
C25	22 N75 10%					*		
C26	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C28	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C29	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C30	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C31	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C32	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C33	9 N4700 10%					*		
C34	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C35	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C36	33 N750 10%		N750-DI 33	DTN-33	C10Q33U	CCTN-330	CN7-433	10TCU-Q33
C37	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C38	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C39	100 N150					*		10TCP-T10
C40	220 10%		DI-220	DD-221	L10T22	CCD-221	GP322	10TS-T22
C41	.1 100V		P288N-1	DF-104	CUB2P1	1DP-2-104	GEM-201	2TM-P10
C42	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C43	50000		BPD-05	DD-503	CUB2S5	1DP-2-503	GP150	5HK-S50
C44	47 N750 10%		N750-DI 47	DTN-47	C10Q47C	CCTN-470	CN7-447	10TCU-Q47
C45	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C46	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C47	82 10%		1469-000082	TCZ-82	22R5Q82	CM-19B-820K	CNO-482	MS-482
C48	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C49	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C50	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C51	1500		SI 1500	D6-152	BYA10D15	CCD-152	B-215	5HK-D51
C52	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C53	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C54	2200 10%		DI-2200		PM6D22	CCD-222	GP222	10TS-D22
C55	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C56	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C57	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C58	82 10%		1469-000082	TCZ-82	22R5Q82	CM-19B-820K	CNO-482	MS-482
C59	1.0 100V		P288N-1.0		CUB2W1	1DP-5-105	GEM-21	2TM-M1
C60	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C61	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C62	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C63	1500		SI 1500	D6-152	BYA10D15	CCD-152	B-215	5HK-D15
C64	.0047 200V		P288N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47

PARTS LIST AND DESCRIPTIONS (Continued)

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C65	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C66	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C67	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P10
C68	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg 250K Tap	½	9E619	BT-174 *				Level, Channel 2
B	2meg 250K Tap	½		STR-174 *				Level, Channel 1
R2A	3meg	½	9E620					Balance, Channel 1
B	3meg	½						Balance, Channel 2
R3A	1meg	½	9E618	B-70	AD47-1meg-Z		FA16A	Bass, Channel 2
B	1meg	½		SR-70	Not Req.		RU16A	Bass, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	
R4A	500K	½	9E617	B-60	AD47-500K-Z		FA55A	Treble, Channel 2
B	500K	½		SR-60	Not Req.		RU55A	Treble, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	

* Do not use Tap #2.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R5	56Ω	
R6	100K	
R7	10K	
R8	3900Ω	
R9	4.7meg	
R10	220K	
R11	2.2meg	
R12	2.2meg	
R13	4700Ω	
R14	180Ω	
R15	6800Ω	
R16	1.5meg	
R17	12K	
R18	68K	
R19	100Ω	
R20	39K	
R21	100K	
R22	180K	
R23	220K	
R24	330K	
R25	4700Ω	
R26	68Ω	
R27	47K	
R28	47K	
R29	15K	
R30	15K	
R31	100K	
R32	100K	
R33	180K	
R34	18K	
R35	470K	Note 1
R36	1meg	
R37	100K	
R38	1000Ω	
R39	10meg	
R40	390K	

RESISTORS (IRC or EQUIVALENT) (cont)

ITEM No.	RATING	REMARKS
R41	470K	
R42	33K	
R43	180K	
R44	100K	
R45	220K	
R46	560Ω	
R47	180K	
R48	3300Ω	
R49	220K	
R50	130Ω 5W	IRC#PW5-130Ω
R51	180K	
R52	18K	
R53	470K	Note 1
R54	1meg	
R55	100K	
R56	470K	
R57	33K	
R58	180K	
R59	100K	
R60	220K	
R61	180K	
R62	560Ω	
R63	3300Ω	
R64	220K	
R65	10K 3W	IRC#PW5-10KΩ
R66	4700Ω 5W	IRC#PW5-4.7KΩ
R67	820Ω 3W	IRC#PW5-820Ω
R68	820Ω 3W	IRC#PW5-820Ω
R69	68Ω	

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		COLUMBIA PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	2nd FM IF Trans.	20E326	FM-254	1463		RTC-8599	
L2	Loopstick	20E341	BC-418				
L3	AM RF Coil	20E339					
L4	AM Osc. Coil	20E338					
L5	1st AM IF Trans.	20E328	BC-352	12-C1	RF-1	RTC-8632	
L6	3rd FM IF Trans.	20E326	FM-254	1463		RTC-8599	
L7	2nd AM IF Trans.	20E328	BC-353	12-C2	RF-2	RTC-8633	
L8	Discriminator	20E340	FM-253	1464		RTC-8665	

CROSSOVER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	COLUMBIA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L9		.6Ω	3.5MH	21E210						

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	COLUMBIA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V ⓐ .9A	620 VCT ⓐ .115A	5V ⓐ 2A	2E114			P-8177 ① ②	22R05 ①		
	SEC. 3	SEC. 4	SEC. 5							
	6.3V ⓐ 4.5A									

① Tape Center Tap on 6.3V Winding. ② Drill New Mounting Holes.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	1E145	12A6A	
SP2	6"	PM	4-6Ω	1E146	6A3IZ5.4	
SP3	6"	PM	4-6Ω	1E146	6A3IZ5.4	
SP4	12"	PM	3-4Ω	1E145	12A6A	
SP5	6"	PM	4-6Ω	1E146	6A3IZ5.4	
SP6	6"	PM	4-6Ω	1E146	6A3IZ5.4	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	COLUMBIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	SC-2D	13TB		26S	S1-1 S3-3			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA		REMARKS
	COLUMBIA PART No.	JENSEN PART No.	
M2		CS-1X † or CS-1XD †♦	† Jewel ♦ Diamond

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		COLUMBIA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3			1N82A	1N82A	AFC (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	COLUMBIA PART No.	NOTES
M4	Tuner		FM
M5	Tuning Cap.	14E109	AM 3 Gang (Ant. 25-331mmf, RF 24-265mmf, Osc. 16-140mmf)
M6	Switch	19E687	Function Selector, Includes Power Off-On (Rotary Wafer Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	19E689	
Dial Pointer	19E688	
Knob	8E510	Tuning, Level, Bass, Treble, Balance, Function
Cabinet	17E842	Mahogany
Cabinet	17E843	Blonde
Cabinet	17E844	Walnut

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

CORONADO MODELS
RA48-8257A, B

CORONADO MODELS
RA48-8257A, B

CORONADO MODELS
RA48-8257A, B

TRADE NAME	Coronado Models RA48-8257A, RA48-8257B
SUPPLIER	Gamble-Skogmo, Inc., 15 N. Eighth Street, Minneapolis 3, Minn.
TYPE SET	AC-DC Operated 5 Tube AM Receiver
POWER SUPPLY	110 - 120 Volts AC-DC
TUNING RANGE—BROADCAST	540 - 1650KC RATING 26 Watts, .25 Amp. @117 Volts AC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4....GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1650KC	"	"	A5	"
3.	"	1500KC	1500KC Signal.	"	A6	Adjust for maximum output. Repeat Steps 2 and 3.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KG159

SET 506 FOLDER 10

PARTS LIST AND DESCRIPTIONS

TUBES

• GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	12BE6	V4	Output	50C5
V2	IF Amplifier	12BA6	V5	Rectifier	35W4
V3	Det. -AVC-AF Amp.	12AV6			

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	CORONADO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	100	150	150-142	PRS2240	BBRD8515	WD235	TDLD-14	TVAS-2463 *	
B	50	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C3	.02 400V		P488N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	4TM-S2
C4	.220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C5	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	.05 200V		P288N-05	DD-503	CUB2S5	4DP-3-503	GEM-415	2TM-S5
C8	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C9	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C10	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CORONADO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	4meg 2meg Tap	½	120-137				PP46T26	Volume
B	Switch						Not Req.	Push-Pull Off-On

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	22K	
R3	2.2meg	
R4	150Ω	
R5	330K	

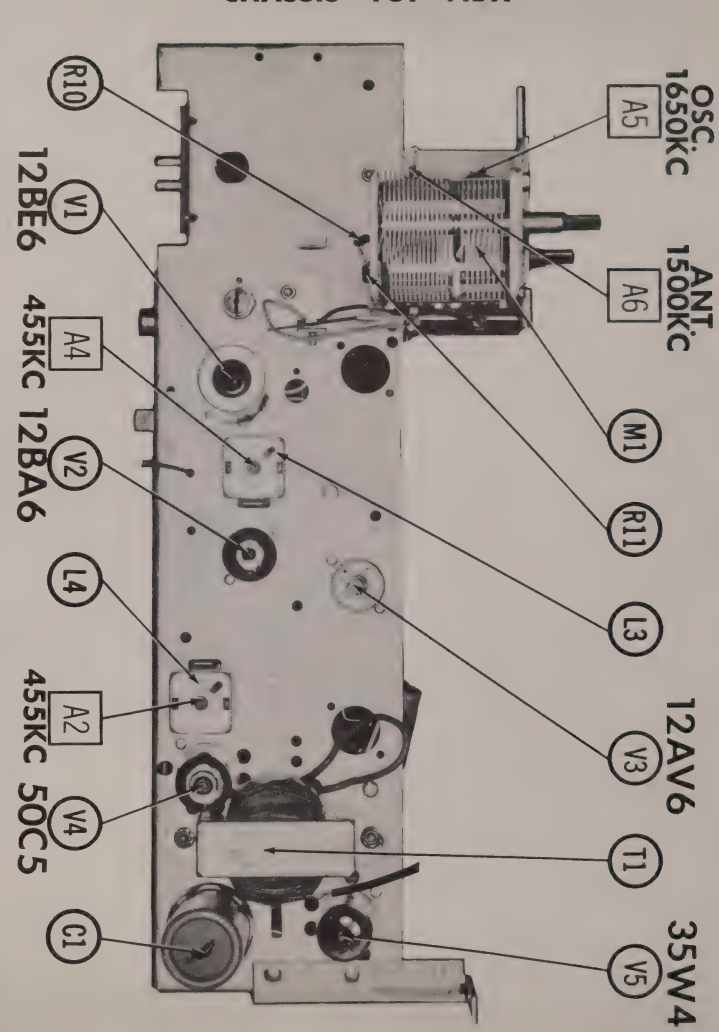
ITEM No.	RATING	REMARKS
R6	6.8meg	
R7	470K	
R8	470K	
R9	150Ω	

ITEM No.	RATING	REMARKS
R10	15K	
R11	680Ω	
R12	1000Ω 1W	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	CORONADO PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	100mmf, 100mmf, 47K	166-107	Aerovox Centralab Cornell-Dubilier Sprague	PA-97 PC-50 111TM1 D-1

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		CORONADO PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	132-140A	BC-419	705-A			
L2	Osc. Coil	136-141A ①	BC-393	69-OSC		RTC-8646	
L3	Input IF Trans.	130-114	BC-352	12-C1	RF-1	RTC-8632	
L4	Output IF Trans.	130-114	BC-353	12-C2	RF-2	RTC-8633	

① Includes R2.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.[1]	CORONADO PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω Tap ② 3%	3-4Ω	138-141						
		SEC. 2							
		200Ω							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	CORONADO PART No.	QUAM PART No.	
SP1	6½"	PM	3-4Ω	175-139A *	6A15	* Alternate Part #175-139

MISCELLANEOUS

ITEM No.	PART NAME	CORONADO PART No.	NOTES
M1	Tuning Cap.	160-131	2 Gang (Ant. 19-365mmf, Osc. 7-89mmf)
M2	Switch	125-111	Radio-Phono (SPDT Slide Type)

CABINETS & CABINET PARTS

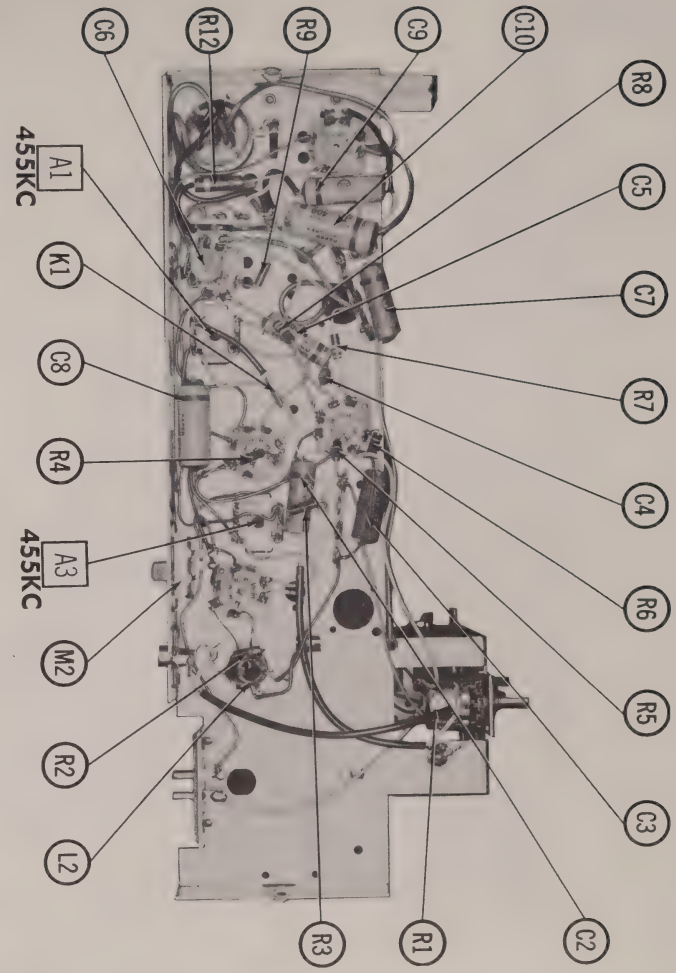
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

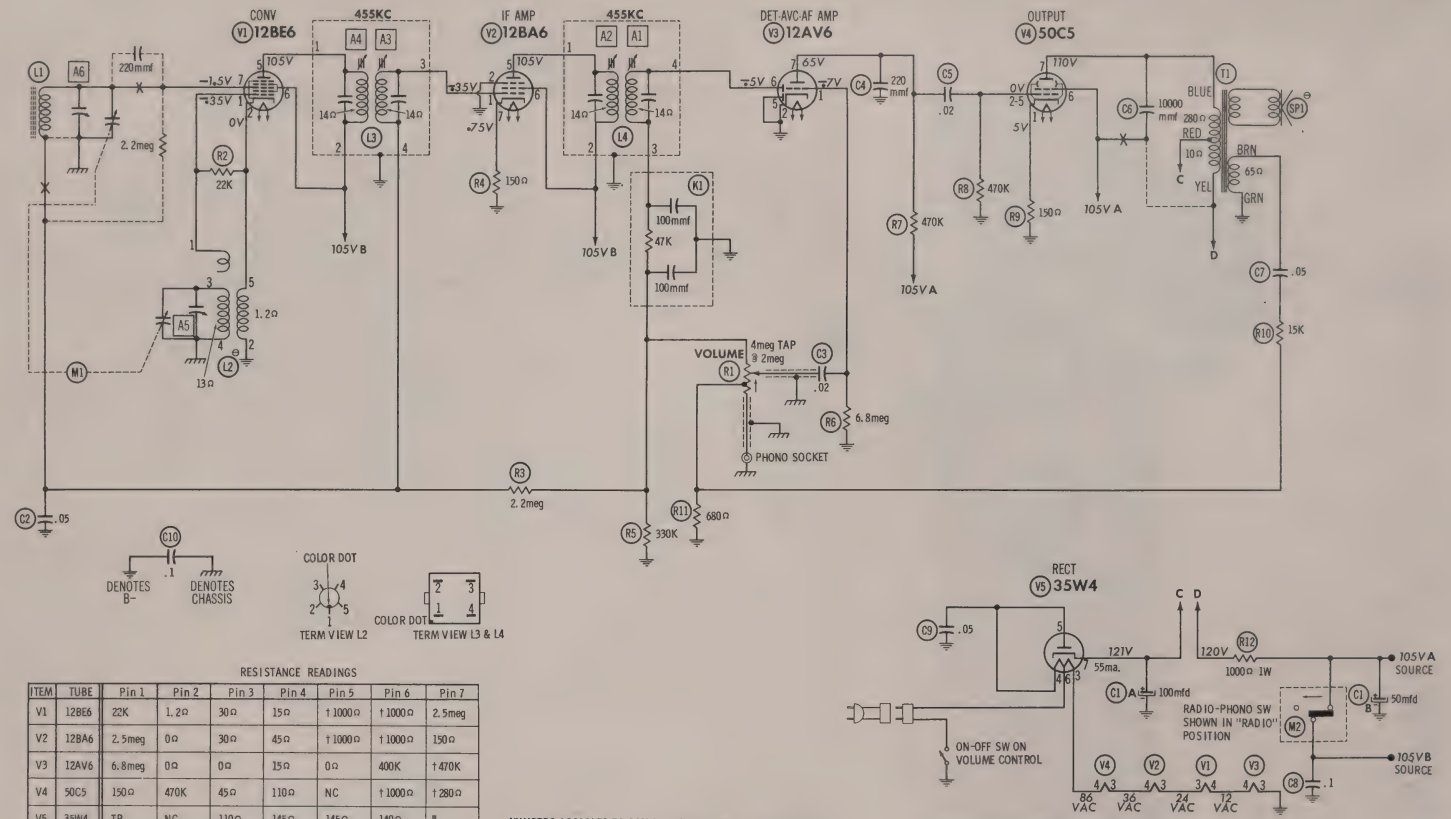
NAME	PART NO.	DESCRIPTION
Indicator	215-165	Dial, Bar Tuning
Knob	220-199	Calibrated Disc.
Knob	220-160	Tuning
Knob	220-157	Volume, Tone
Cabinet	210-157	Shell

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)

CHASSIS—BOTTOM VIEW





RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	1.2Ω	30Ω	15Ω	†1000Ω	†1000Ω	2.5meg
V2	12BA6	2.5meg	0Ω	30Ω	45Ω	†1000Ω	†1000Ω	150Ω
V3	12AV6	6.8meg	0Ω	0Ω	15Ω	0Ω	400K	†470K
V4	50C5	150Ω	470K	45Ω	110Ω	NC	†1000Ω	†280Ω
V5	35W4	TP	NC	110Ω	145Ω	145Ω	140Ω	¶

¶ THIS READING WILL VARY DEPENDING UPON CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT. ALL MEASUREMENTS TAKEN IN "RADIO" POSITION.
† MEASURED FROM PIN 7 OF V5.
NC NO CONNECTION
TP TIE POINT

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

CORONADO MODELS RA48-8257A, B

PHOTOFACT® Folder

CURTIS MATHES MODELS 2014A, 2214A, 2414A (Ch. 14A)

CURTIS MATHES MODELS
2014A, 2214A, 2414A (Ch. 14A)

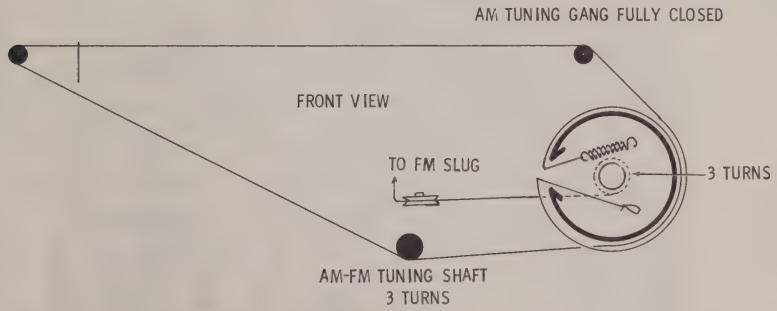
CURTIS MATHES MODELS
2014A, 2214A, 2414A (Ch. 14A)

MODEL 2014A

TRADE NAME	Curtis Mathes Models 2014A, 2214A, 2414A (Ch. 14A)		
MANUFACTURER	Curtis Mathes Mfg. Co., 2220 Young Street, Dallas, Texas		
TYPE SET	AC Operated 11 Tube FM-AM Receiver With Stereo Amplifier And 4 Speed Automatic Record Changer		
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles	RATING	95 Watts, .88 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 — 1620KC	FREQ. MOD.	88 — 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #11A6 — SEE SIMILAR V-M 1201 — PHOTOFACT SET 436 FOLDER 18 OR RECORD CHANGER MANUAL RC-12

DIAL CORD STRINGING



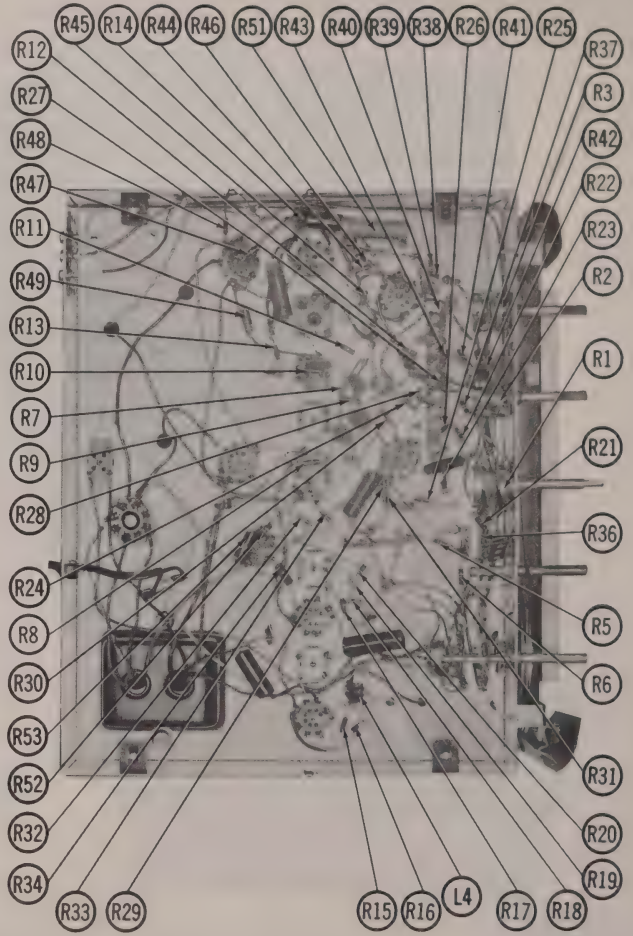
HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

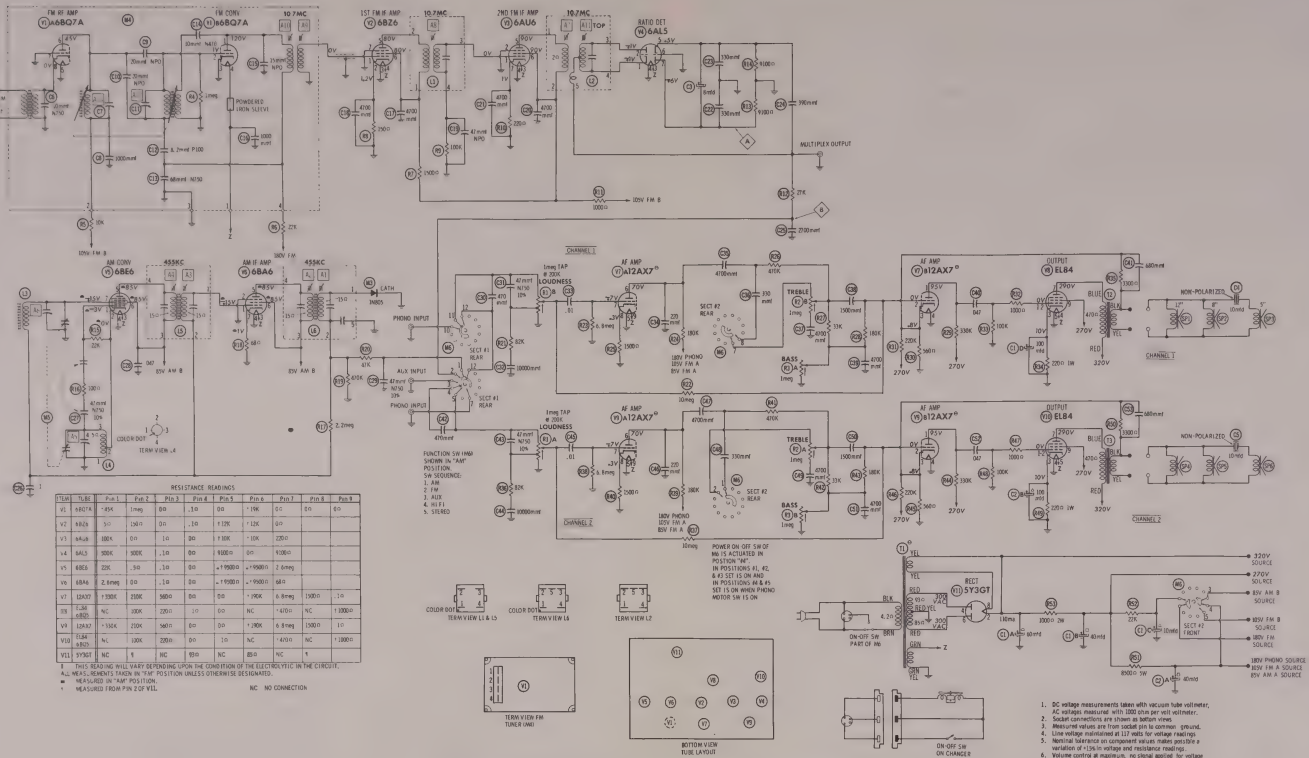
KN030

SET 506 FOLDER 11

CHASSIS BOTTOM VIEW –
ALIGNMENT, CAPACITOR & MISC. IDENT.



CHASSIS BOTTOM VIEW –
RESISTOR & INDUCTOR IDENT.



RESISTANCE READINGS

TUBE	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	455K	1meg	0Ω	.1Ω	0Ω	*19K	0Ω	0Ω	0Ω
V2	6BQ7A	3Ω	150Ω	0Ω	.1Ω	*12K	*12K	0Ω		
V3	6BZ6	100K	0Ω	1Ω	2Ω	*100K	*10K	220Ω		
V4	6AU6	300K	300K	.1Ω	0Ω	900Ω	0Ω	900Ω		
V5	6BE6	22K	3Ω	.1Ω	0Ω	*950Ω	*950Ω	2.6meg		
V6	6BA6	2.6meg	0Ω	.1Ω	0Ω	*950Ω	*950Ω	68Ω		
V7	12AX7	*330K	250K	560Ω	0Ω	0Ω	*90K	6.8meg	1500Ω	1Ω
EN	EL84 6BQ5	NC	100K	220Ω	1Ω	0Ω	NC	*470Ω	NC	*1000Ω
V9	12AX7	*330K	250K	560Ω	0Ω	0Ω	*90K	6.8meg	1500Ω	1Ω
V10	EL84 6BQ5	NC	100K	220Ω	0Ω	1Ω	NC	*470Ω	NC	*1000Ω
V11	5Y3GT	NC	1Ω	NC	950Ω	NC	85Ω	NC	1Ω	

Ω = THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEAS., REMOTE, TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
= MEASURED IN "AM" POSITION.
* MEASURED FROM PIN 2 OF V11. NC NO CONNECTION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes positive a variation of +15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

CURTIS MATHES MODELS
2014A, 2214A, 2414A (Ch. 14A)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loudness control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:

A1 thru A4, A8....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989 WALSCO #2515, 2531, 2532
A5, A6.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A7, A11.....	GENERAL CEMENT #9091, 9091-L WALSCO #2542
A9, A10.....	GENERAL CEMENT #9440
A12, A13.....	GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089 WALSCO #2512, 2525, 2528

AM ALIGNMENT— SELECTOR IN AM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of AM Converter. Low side to chassis.	455KC (400∿ Mod.)	(AM) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	1620KC	"	"	A5	"
3.	"	1400KC	1400KC Signal.	"		Set pointer to 1400 on dial.
4.	Loop	"	"	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	Across FM antenna terminals with 150Ω in each lead.	10.7MC (Unmod.)	(FM) Point of non-interference.	DC probe to point Ⓐ. Common to chassis.	A7, A8, A9, A10	Adjust for maximum deflection.
6.	"	"	"	DC probe to point Ⓑ. Common to chassis.	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE—SELECTOR IN FM POSITION

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	Across FM antenna terminals with 150Ω in each lead.	10.7MC (450KC Swp)	(FM) Point of non-interference.	Vert. Amp. to point Ⓐ. Low side to chassis.	A7, A8, A9, A10	Disconnect stabilizing capacitor C3. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C3.
6.	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A11	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of cross-over lines.

FM RF ALIGNMENT—SELECTOR IN FM POSITION

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	Across FM antenna terminals with 150Ω in each lead.	100MC (Unmod.)	(FM) 100MC Signal.	DC probe to point Ⓐ. Common to chassis.	A12, A13	Adjust for maximum output.

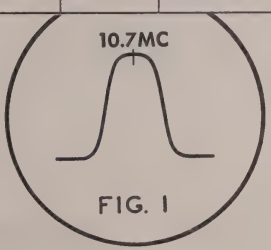


FIG. 1

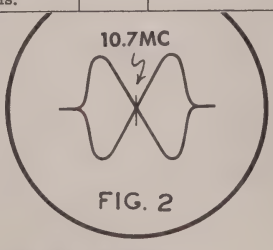
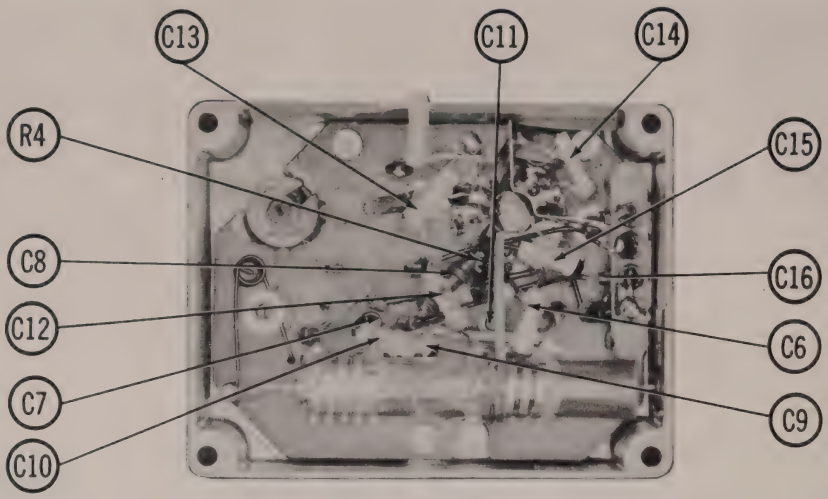
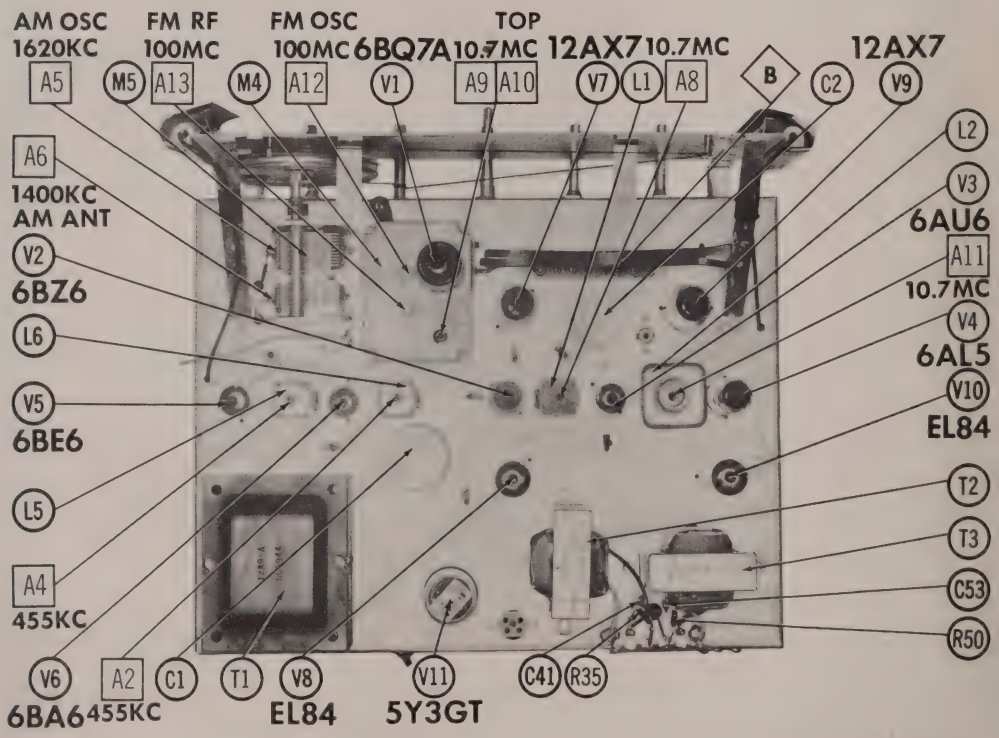


FIG. 2



FM RF SUBCHASSIS



CHASSIS — TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	FM RF Amp. -FM Conv.	6BQ7A
V2	1st FM IF Amplifier	6BZ6
V3	2nd FM IF Amplifier	6AU6
V4	Ratio Detector	6AL5
V5	AM Converter	6BE6
V6	AM IF Amplifier	6BA6
V7	Channel 1 AF Amplifier	12AX7 (7025) *
V8	Channel 1 Output	EL84/6BQ5
V9	Channel 2 AF Amplifier	12AX7 (7025) *
V10	Channel 2 Output	EL84/6BQ5
V11	Rectifier	5Y3GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA Curtis Mathes PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	400	4A4	AFH4-123	D0477.5	FP454.8	TMQ-4722	TVL-4811	
B	■40	400							
C	▲10	400							
D	100	25							
C2A	■40	400	4A13	AFH2-86-45	B0623	FP229.55	TMD-2450	TVL-2651	
B	▲100	25							
C3	8	25	4A18	PRS1405	BBR8-150	TT25X8	TD-8-150	TVA-1405	
C4	10	25NP		PRS7315	BBR10-150	TCN5010		TVANS-1204.1*	
C5	10	25NP		PRS7315	BBR10-150	TCN5010		TVANS-1204.1*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	10 N750		N750-SI 10	TCN-10	C10Q10U	CCTN-100	CN7-410	10TCU-Q10
C7								
C8	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C10	20 NPO		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	CNO-422	10TCC-Q20
C11								
C12	8.2 P100					*		
C13	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C14	10 N470					*		
C15	15 NPO		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C16	1000		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C17	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C18	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C19	47 NPO		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCU-Q47
C20	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C21	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C22	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	10TS-T33
C23	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	10TS-T33
C24	390		DI-390	DD-391	L10T39	CCD-391	B-339	10TS-T39
C25	2700		DI-2700	DD-272	L10D27	CCD-272	B-227	10TS-D27
C26	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-D10
C27	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C28	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C29	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C30	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C31	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C34	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C35	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C36	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	10TS-T33
C37	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C38	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C39	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C40	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C41	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68
C42	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	10TS-T47
C43	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C44	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C45	.01 200V		P288N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C46	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C47	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C48	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	10TS-T33
C49	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C50	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C51	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C52	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C53	680		BPD-00068	DD-681	BYA10T68	CCD-681	B-368	10TS-T68

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Curtis Mathes PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg 200K Tap	½	2A38					Loudness, Channel 2
B	1meg 200K Tap	½						Loudness, Channel 1
R2A	1meg	½	2A39	B-70	AD47-1meg-Z		FA16A	Treble, Channel 2
B	1meg	½		SR-70	Not Req.		RU16A	Treble, Channel 1
C	Shaft			Not Req.	FS-3		CS3500	
R3A	1meg	½	2A39	B-70	AD47-1meg-Z		FA16A	Bass, Channel 1
B	1meg	½		SR-70	Not Req.		RU16A	Bass, Channel 2
C	Shaft			Not Req.	FS-3		CS3500	

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1meg	
R5	10K	
R6	22K	
R7	1500Ω	
R8	150Ω	
R9	100K	
R10	220Ω	
R11	1000Ω	
R12	27K	
R13	9100Ω	
R14	9100Ω	
R15	22K	
R16	100Ω	
R17	2.2meg	
R18	68Ω	
R19	470K	
R20	47K	

ITEM No.	RATING	REMARKS
R21	82K	
R22	10meg	
R23	6.8meg	
R24	180K	
R25	1500Ω	
R26	470K	
R27	33K	
R28	180K	
R29	330K	
R30	560Ω	
R31	220K	
R32	1000Ω	
R33	100K	
R34	220Ω 1W	
R35	3300Ω	
R36	82K	
R37	10meg	

ITEM No.	RATING	REMARKS
R38	6.8meg	
R39	180K	
R40	1500Ω	
R41	470K	
R42	33K	
R43	180K	
R44	330K	
R45	560K	
R46	220K	
R47	1000Ω	
R48	100K	
R49	220Ω 1W	
R50	3300Ω	
R51	8500Ω 5W	IRC#PW5-8.5KΩ
R52	22K	
R53	1000Ω 2W	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Curtis Mathes PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	2nd FM IF Trans.	1A10	FM-254	1463		RTC-8599	
L2	Ratio Det.	1A9	FM-252	1465 *		RTC-8600 *	
L3	Loopstick	1A35	BC-418				
L4	AM Osc. Coil	1A36	BC-393	70-OSC		RTC-8647	
L5	1st AM IF Trans.	1A7	BC-352	12-C1	RF-1	RTC-8632	
L6	2nd AM IF Trans.	1A8	BC-355	12-C6		RTC-8634	

* Use Adapter Plate.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	Curtis Mathes PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	117V Ⓐ Ⓐ. 88A	600 VCT Ⓐ. 110A	5V Ⓐ 2A	12A9A①				22R05②		
	SEC. 3	SEC. 4	SEC. 5							
	6.3V Ⓐ 4.1A									

① Alternate Part #12A9. ② Drill New Mounting Holes. Tape C.T. on 6.3V Winding.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Curtis Mathes PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	9800Ω	3-4Ω	10A15-1	A-2902①	AU-606	A-3824①	22S62	S-53X①	
T3	9800Ω	3-4Ω	10A15-2	A-2902①	AU-606	A-3824①	22S62	S-53X①	

① Drill New Mounting Holes.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Curtis Mathes PART No.	QUAM PART No.	
SP1	12"	PM	3-4Ω	12JB-38A	12A6A	
SP2	8"	PM	8-10Ω	8EV-39	8A1Z8.4	
SP3	5"	PM	6-8Ω	5CM-98	5A15Z7.8	
SP4	12"	PM	3-4Ω	12JB-38A	12A6A	
SP5	8"	PM	8-10Ω	8EV-39	8A1Z8.4	
SP6	5"	PM	6-8Ω	5CM-98	5A15Z7.8	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	Curtis Mathes PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		13TB		26-S	S1-1 S3-3	53	J43 & J-47X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA		REMARKS
	Curtis Mathes PART No.	JENSEN PART No.	
M2		S69X † or S69XS †♦ or S69XDD ♦	† Jewel ♦ Diamond

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Curtis Mathes PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N805	1N805	1N60	1N60	AM Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	Curtis Mathes PART No.	NOTES
M4	FM Tuner	7A5	Complete
M5	Tuning Cap.	3A8	AM, 2 Gang (Ant. 35-550mmf, Osc. 16-117mmf)
M6	Switch		Function Switch, Includes Power Off-On (Rotary Wafer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	2B7	
Knob	11B6-1	Loudness
Knob	11B7-1	Loudness
Knob	11B4	Tone, Function, Tuning

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

GLASER-STEERS
MODEL GS-400

GLASER-STEERS
MODEL GS-400

GLASER-STEERS
MODEL GS-400

GENERAL INFORMATION

Glaser-Steers Model GS-400 Stereo/Monaural Record Changers are designed to play a stack of records in automatic sequence and shut off after playing the last record.

These changers use the velocity trip mechanism for changing records. The sound output is muted during the change cycle.

Record separation is accomplished by movement of a finger in the center spindle that directly separates records having a 1/4" center hole.

Connect this changer to an outlet supplying 117 volts, 60 cycles AC only, unless otherwise specified.

Manufactured by:

Glaser-Steers Corporation
155 Oraton St.
Newark 4, New Jersey

SET 506 FOLDER 12

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

CQ432

OPERATING INSTRUCTIONS

Loading

1. Raise the record balance arm (2) and swing it to the right.
2. Load up to ten records with a 1/4" center hole onto the spindle.

NOTE: 7,-10,-and 12-inch records may be intermixed providing they are of the same speed.

3. Place record balance arm (2) over the records.

Playing

1. Set the speed selector to the type records to be played.
2. Turn the "On-Off-Reject" control to the "On-Reject" position and release. The records will automatically play and the mechanism will shut off after the last record is played.

Manual Operation

1. Turn speed selector to the correct record speed.
2. Turn stylus to "LP" for 16, 33, and 45 rpm records and to "78" for 78 rpm records.
3. Place a record onto the turntable.
4. Turn the "On-Off-Reject" control to "On". The tone arm will come in to the 7" position. Move the tone arm back to its rest post. (The tone arm may be stopped just before it lands on the record and returned to its rest post).
5. Set tone arm on any position of the record and begin playing.

NOTE: In manual play, the tone arm will not cycle after playing a record. The changer will remain in manual play position until the "On" lever is turned to the "On" position.

6. To stop the changer, turn the "On-Off-Reject" lever to the "Off" position.

ADJUSTMENTS

Stylus Pressure

Turn knurled nut (14) to adjust the stylus pressure. With tone arm in horizontal position, turn the nut from right to left to decrease pressure and from left to right to increase pressure. Adjust to pressure recommended for your cartridge.

Set-Down

Lift tone arm upward about 1 inch from its rest post and set-down adjusting screw (15) becomes accessible under rear of tone arm. Using any size record, adjust so the stylus comes to rest on the lead-in groove. Turning screw clockwise moves stylus away from center.

Tone Arm Height

Pivot the tone arm to an almost vertical position. Adjust height adjustment screw (8) so the tone arm clears the highest point of the rest post by approximately 1/8 inch.

CHANGE CYCLE

Observe the change cycle operation by removing the turntable and turning the changer on, or by manually rotating the cycling gear (85) counterclockwise. The action to be described can then be readily followed and each part's function more easily understood.

This changer has a velocity trip mechanism. The change cycle is started by the fast inward motion of the tone arm when the needle enters the leadout groove at the end of a record.

Tone arm hinge assembly and velocity trip arm (53) are secured together so they move in unison. While a record is playing, the slight movement of velocity trip arm (53) is not sufficient to trip the mechanism because the wiping action by velocity trip cam (70) moves velocity trip arm (53) back with each revolution of the turntable.

In the first revolution of the turntable, as the tone arm advances rapidly toward the spindle, velocity trip arm (53) is moved fast enough and far enough to engage velocity trip cam (70). Contact between velocity trip arm (53) and velocity trip cam (70) gives the necessary lift to force cycle control lever (86) out of engagement with driver pinion arm (88). Driver pinion arm (88) by action of driver arm spring (87), brings driver pinion wheel (105) into engagement with the motor pulley, supplying driving force to cycling gear (85). As the cycling gear (85) rotates, the main slide (29) moves to the left through the action of the eccentric mounted pin on cycling gear (85) riding in the cross slot on the main slide assembly (29).

As main slide (29) begins to move, cam (29A) (part of main slide) will cause tone arm index ratchet (44) to move down. This pulls the back part of the tone arm hinge assembly (42) down, lifting the front part of the tone arm up and off the record. Projection (29B) on rear of main slide (29) now comes into con-

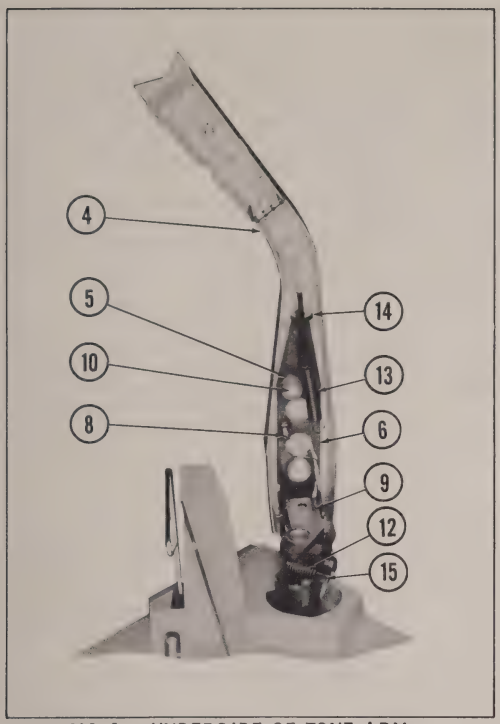


FIG.1 UNDERSIDE OF TONE ARM

LUBRICATION

These changers are lubricated before leaving the factory and should not require any additional lubrication except in cases of unusual use or high operating temperature.

When lubrication is required, use a nonhardening grease on the following parts:

1. Edge of all slots in main slide assembly (29).
2. Outer edges of main slide assembly (29).
3. Cam surface (29A) on main slide assembly (29).
4. Speed shift cam (98).
5. Spindle slide slot (96).

Lightly oil the following parts:

1. Bearing holes of tone arm hinge assembly (42).
2. Bearing of driver arm assembly (88).

CLEANING

Remove the turntable and clean the foreign matter from the turntable rim occasionally. Clean the cartridge with a soft brush.

tact with safety spring (54), forcing the spring forward. Safety spring (54), tone arm hinge assembly (42), and tone arm index ratchet (44) are secured together so they move in unison. The action of safety spring (54), tone arm hinge assembly (42), and tone arm index ratchet (44) pivot the arm toward rest post (18).

As the tone arm moves toward the rest post, spindle actuating crank (112), attached to bottom part of cycling gear (85) has rotated far enough to actuate spindle slide (96), moving it to the left. Spindle slide (96) actuates the spindle, dropping one record onto the turntable.

At about the same time, index finger (1) moves forward by action of the main slide (29) moving away from the index finger. As the record drops to the turntable, the record either strikes or misses the index finger (1), depending on the size of the record. When a 7-inch record drops, the record completely misses the index finger (1). This causes pawl catch assembly (63) to be caught in the first notch, which in turn places index pawl (59) in the first notch of the tone arm index cam (part of 42). The tone arm will now move out to the 7-inch set-down position. When a 10-inch record falls, the record strikes the index finger (1) just enough to move the index finger (1) to the next series of notches. The tone arm will move out to the 10-inch set-down position. The 12-inch record acts the same as a 10-inch record, except the third series of notches comes into contact. The tone arm will now move out to the 12-inch set-down position.

As the main slide (29) reverses direction of travel, the extension spring attached to tone arm index ratchet assembly (44) will move the tone arm out over the record, at which time, the tone arm index ratchet assembly (44) moves up. This action places the tone arm down on the lead-in groove of the record. Cycling gear (85) now rotates to its out of cycle position, allowing the tone arm to move freely across the record.

It again follows the preceding sequence of cycling and playing of records, until the last record of the stack has been played.

As the last record of a stack drops to the turntable, balance arm (2) drops below the off-set shelf on spindle assembly (74). The lower end of balance arm (2) contacts shut-off wire (57), forcing it downward. The shut-off wire (57) holds stop catch pawl (62) up and stop catch pawl (62) then drops; thus, blocking pawl assembly (59) to move inward to catch the last notch on tone arm index ratchet assembly (44). This action will allow the tone arm to come to the rest post and remain there. The tone arm is held from moving in by action of index ratchet assembly (44). Being in the last notch, control slide assembly (65), attached to index cam (part of 42) is stopped from moving toward the right. When control slide assembly (65) fails to move, shut-off pivot (107) remains in the up position, holding switch lever assembly (102) up and in contact with the projection on the bottom of cycling gear (85). As the projection on cycling gear (85) strikes switch lever assembly (102), power is removed from the motor and the mechanism stops.

TROUBLE CHART

Symptom	Cause	Remedy
Changer does not operate when control is turned to "On-Reject" position.	1. No power to motor.	1. Check to see that power is reaching motor. Check wiring connections at switch and motor.
	2. Line voltage too low.	2. Line voltage must be at least 105V.
	3. Change cycle not complete.	3. Remove retaining ring (20) from the record spindle. Remove turntable by lifting it straight up. Turn main gear (85) with crank pin in counterclockwise direction till crank pin is in line with notch in main slide (29).
	4. Lubricant on Pinion-drive wheel (105) tire.	4. Remove turntable and clean pinion drive wheel (105) tire with a lint-free cloth moistened with alcohol. Clean motor shaft, idler wheel (77), and inside of turntable rim.
On-Off control cannot be turned to "On-Reject" position.	1. Change cycle not completed.	1. See remedy 3 in preceding trouble.
Turntable will not rotate but changer will cycle and tone arm will come into playing position.	1. Idler wheel (77) not engaging turntable and motor shaft.	1. Spring (110) broken or weak and not pulling idler wheel (77) into contact with motor shaft.
	2. Excessive friction between cam (98) and pin of idler arm (81).	2. Lubricate top surfaces of steps on cam (98).
Turntable speed varies, or too low.	1. Incorrect line voltage.	1. Line voltage should be between 105 and 120 volts.
	2. Oil or grease on idler wheel (77), motor shaft, or turntable (22).	2. Wash all surfaces that contact each other and all diameters on motor shaft with alcohol.
	3. Turntable binds.	3. Remove turntable and clean bushing and spindle (74) surfaces and relubricate with light oil.
	4. Idler wheel (77) and diameters on motor shaft pulley misaligned.	4. Bend idler arm (81) so it is parallel to motor plate and contacts the steps on motor shaft pulley, respectively.
Speed changing difficult.	1. Motor and switch leads interfering with speed change link.	1. Dress leads so they are clear of any moving parts.
	2. Idler arm (81) bent.	2. See remedy 4 in preceding trouble.
	3. Crank on speed knob interfering with motor board.	3. Make certain the mounting springs on the changer are in the holes provided.
Changer will not cycle after a record has finished playing while in automatic play.	1. Velocity trip lever (53) not reaching trip cam (70).	1. Dress power and cartridge lead away from trip cam (70). Trip lever (53) bent. Correct level of free end should be from 1/8" to 1/4" above motor plate.
Tone arm does not set down in the lead-in groove of the record.	1. Tone arm not properly adjusted.	1. Adjust screw (15) so the stylus lands midway in the margin at the beginning of all records.
Tone arm does not land on first record or interfers with records loaded on spindle during cycling.	1. Incorrect height adjustment.	1. Height adjustment screw (8) should be adjusted so that tone arm will clear the lower edge of the restpost and the top of the tone arm clears the lower record on the spindle.
During the change cycle, tone	1. Incorrect height adjustment.	1. See preceding remedy.

Symptom	Cause	Remedy
arm will not leave the rest post and changer shuts off.	2. Incorrect set down adjustment. 3. Balance arm (2) down.	2. See "Set Down Adjustment". 3. Raise balance arm (2) and swing over rest post (18) or load records onto spindle.
Changer will shut off with balance arm up after every cycle.	1. Switch lever (102) fails to fall to its downward position. 2. Tone arm (4) remains on rest post (18).	1. Clean foreign material from shaft and switch lever (102). Do not oil. 2. Raise balance arm (2) and swing over rest post(18)or load records onto spindle.
Changer will not shut off automatically after the last record has been played.	1. Balance arm (2) is not down fully. 2. Balance arm (2) does not push shut-off wire (57) down.	1. Clean balance arm (2) shaft and bearing holes of any foreign matter and lubricate. 2. Check to see if retaining ring is in place at bottom of balance arm shaft and that the shut-off wire (57) is below the ring and making contact with the shaft.
Will not index for 10" records.	1. Improper interference between 10" record and index finger (1).	1. If tone arm sets down in 7" position instead of 10", turn changer off, place a 10" record on turntable and bring index finger (1) completely forward by hand. Raise record along the spindle, keeping it parallel to turntable, and it should interfere with the nose of index finger (1) by approximately 3/32". To adjust the index finger to this dimension, bend forward in direction of the record. Do not overbend so as to exceed the 3/32" required. If tone arm sets down in 12" position instead of 10", use same procedure as above but bend index finger in opposite direction.
Changer indexes for 12" record repeatedly.	1. Spring (67) broken or too weak not allowing index finger (1) to come forward during cycle. 2. Index finger (1) scraping slot in balance arm support (16).	1. If spring (67) broken, replace. If weak, stiffen spring by removing 2 coils at a time until index finger returns to forward position during change cycle. 2. Bend finger to clear slot.
Two records drop at the same time.	1. Center hole too large in record. 2. Small blade in upper portion of spindle not fully down.	1. Discard record. 2. Straighten blade so it falls freely under its own weight. If not bent, clean slot and blade of any foreign matter and lubricate. Do not oil.
Low pitch noise or thumping sound during record play.	1. Motor not floating freely on rubber mounts (111). 2. Idler wheel (77) damaged. 3. Flat spot developed on idler wheel (77). 4. Foreign matter on idler rubber tire or idler bearing, or in turntable bearing or bushing.	1. Make sure motor is not touching any part of cabinet. 2. Replace idler wheel (77). 3. Run changer for at least 10 minutes. If thumping does not disappear replace idler wheel (77). 4. Clean these parts. Lubricate idler and turntable bearings. If idler wheel (77) is oil soaked, replace.
Tone arm skips grooves in record.	1. Worn stylus in cartridge. 2. Tracking pressure for cartridge	1. Replace stylus. 2. Check tracking pressure and ad-

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	used improperly. 3. Changer not level. 4. Cartridge leads interfering with motion of tone arm.	just to recommended pressure. 3. Level changer. 4. Dress cartridge leads so tone arm is not affected by them in its entire lateral travel.
No sound when playing records.	1. Defective cartridge. 2. Defective wiring. 3. Loose cartridge terminal clips. 4. Muting switch out of adjustment.	1. Replace cartridge. 2. Check for shorted or open leads. 3. Remove clips from terminals, slightly squeeze and refasten to cartridge. 4. Check to see if contacts have clearance when cycle is completed. If necessary bend blades to obtain clearance. Check to see if contacts are touching when main slide (29) withdraws.
Tone arm skates in over starting groove.	1. Changer not level.	1. Level changer.
Tone arm goes to 10" position when playing 7" records.	1. Index finger (1) does not come all the way forward.	1. Shorten the length of the extended end of spring attached to main slide (29) by bending. This will allow the finger to move forward before it is caught by the pawl.
Changer will not shut off when turning lever to off.	1. Hinged wire rod (107) does not raise shut-off lever (102) high enough.	1. Unexposed end of rod (107) is under cycle control slide (65). Remove cycle control slide (65) and replace with rod (107) resting on top of slide (65). Bend end of shut-off switch lever (102) upward so the lanced tab on gear (85) will engage the lever.
Spindle will not drop last record or a record.	1. Balance arm (2) not holding records parallel to turntable. 2. Record push-off fingers of spindle not retracting within the spindle diameter.	1. Twist or bend balance arm (2) slightly in required direction. 2. Hold ends of blades under motor base and bend these fingers back so they fall inside the diameter of the top portion of spindle and clear the shelf.
Erratic indexing.	1. Tone arm pivot is loose.	1. Loosen nut, tighten screw gently and then back off 1/8 turn and tighten nut.

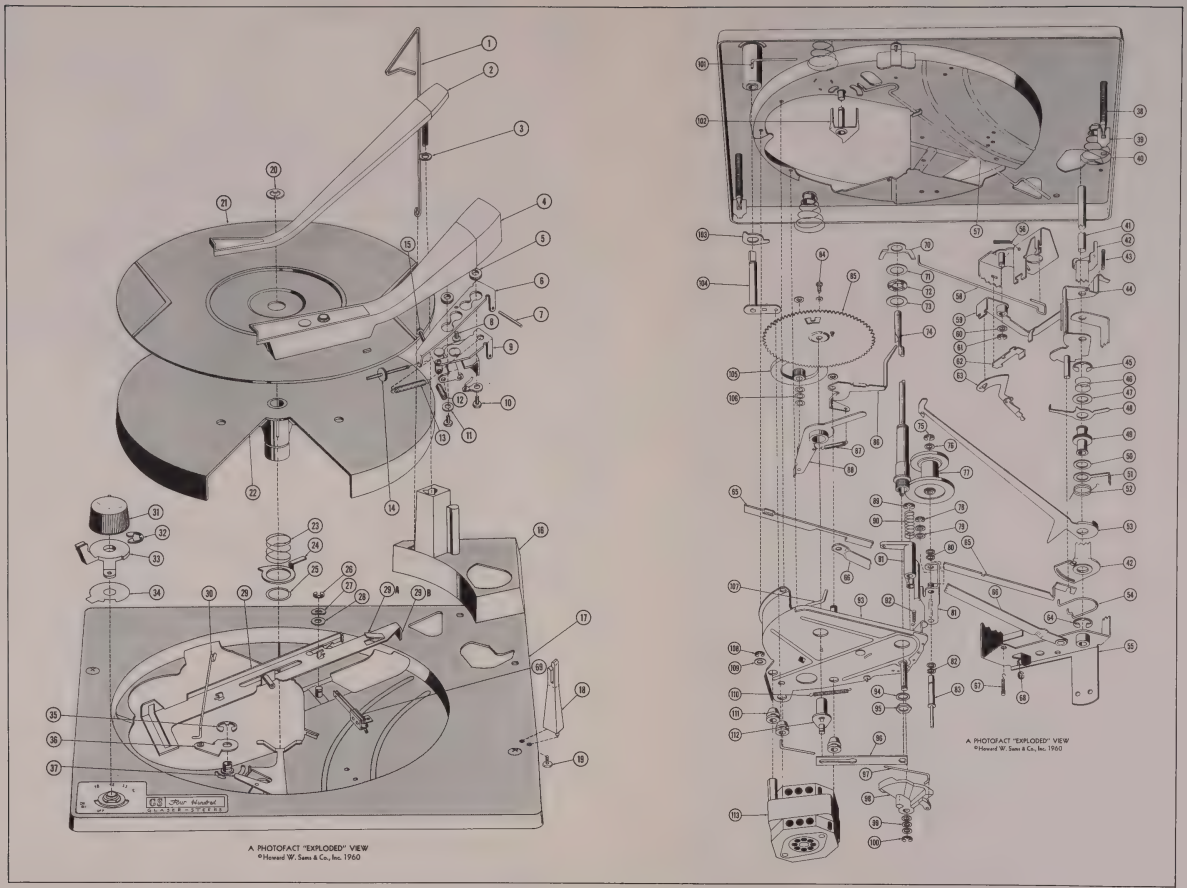


FIG.2 EXPLODED VIEW OF MECHANISM

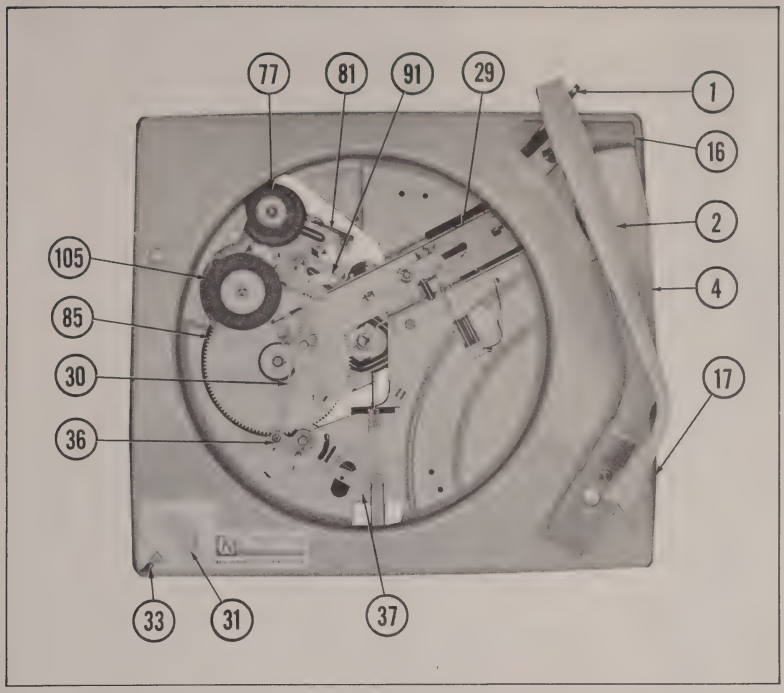


FIG.3 TOP VIEW OF MECHANISM WITH TURNTABLE REMOVED

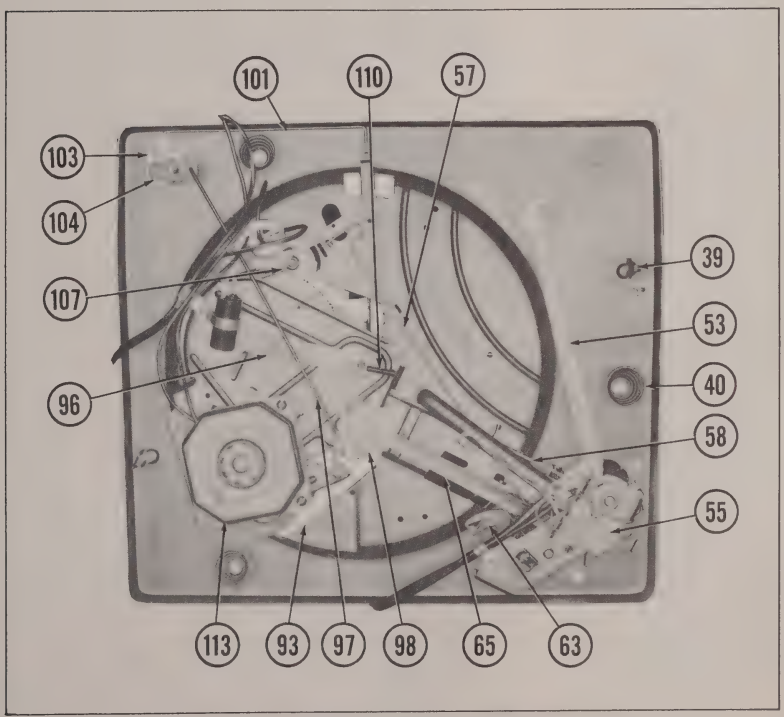


FIG.4 BOTTOM VIEW OF MECHANISM

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	11411-3	Index Finger
2	5709-506	Balance Arm
3		Felt Washer
4	5723-504	Tone Arm
5		Grommets, Tone Arm
6		Tone Arm Mounting Bracket
7		Tone Arm Pivot Pin
8		Height Adjusting Screw
9		Tone Arm Pivot Bracket
10		Mounting Screw
11		Washer
12		Indexing Spring
13		Stylus Pressure Spring
14		Stylus Pressure Adjusting Nut
15		Stylus Set-down Adjusting Screw
16	13401-2	Balance Arm Support
17	5502-502	Base Plate
18	12312-1	Rest Post
19	1021-10	Screw
20	1424-SBO-X43	Turntable Retaining Ring
21	13403-1	Turntable Mat
22	5708-505	Turntable
23	11428-1	Spring Cam
24	11049-1	Anti-Skate Cam
25	11427-1	Ring
26		Retaining Ring
27		Spring Washer
28		Washer
29	5506-506	Main Slide Assembly
30	11426-1	Neutral Wire
31	12313-1	Speed Knob
32		Retaining Ring
33	10155-1	On-Off Lever
34		Plastic Washer
35		Retaining Ring
36	11050-1	Neutral Lever
37	5740-501	Control Lever Assembly
38	11805-3	Transit Mounting Screw
39	11806-1	Transit Mounting Screw Clip
40		Mounting Spring
41	10194-1	Tone Arm Pivot Pin
42	5745-502	Tone Arm Hinge Assembly
43	12926-7	Extension Spring
44	5702-507	Index Ratchet Assembly
45		Retaining Ring
46		Spring
47		Washer
48	11035-1	Anti-Skate Lever
49		Bushing
50		Washer
51		Reset Washer
52	11407-1	Trip Arm Spring
53	5732-503	Velocity Trip
54	11406-1	Safety Spring
55	5734-502	Index Tone Arm Brkt. Ass'y.
56	12926-11	Spring
57	12925-1	Shut-Off Wire
58	11419-1	Anti-Skate Wire Rod
59	5702-506	Index Pawl Assembly
60	1063-1	Washer
61	1424-SP-15	Retaining Ring
62	11007-1	Stop Catch Pawl
63	5702-508	Pawl Catch
64	1424-SP-23	"C" Washer
65	12483-1	Control Slide
66	11029-1	Brace
67	12926-12	Index Finger Spring
68		"C" Washer
69	5755-501	Muting Switch
70	12475-1	Trip Cam
71	11804-2	Spindle Thrust Washer
72	11804-1	Spindle Ball Bearings
73	11804-2	Spindle Thrust Washer
74	12001-1	Spindle Assembly
75		"C" Washer
76		Fiber Washer
77	13014-3	Idler Wheel
78		"C" Washer
79		Washers
80		Washers
81	5702-511	Idler Arm
82		Washers
83		Idler Arm Shaft
84		Screw
85	5703-502	Gear Assembly
86	5705-509	Cycle Control Lever
87	12926-2	Driver Arm Spring
88	5703-510	Driver Arm Assembly
89		"C" Washer
90		Coil Spring
91		Part of Item 81
92	12926-22	Spindle Slide Spring
93	5505-502	Motor Plate Sub Assembly
94		Washer
95	1296-5	Spindle Nut
96	11052-1	Spindle Slide
97	11403-1	Cam Rod
98	12303-1	Speed Shift Cam
99		Washers
100		"C" Washer
101	11401-1	On-Off Rod
102	5506-501	Switch Lever
103	11047-1	Speed Knob Stop
104	5712-503	Arm Shaft Assembly
105	10001-2	Pinion-Drive Wheel
106		Fiber Washers
107	11402-1	Shut-Off Pivot
108	1424-SP-18X	"C" Washer
109		Steel Washer
110	12926-1	Idler Wheel Spring
111	10152-1	Motor Mount Grommet
112	5703-503	Spindle Actuating Crank
113	13004-2	Motor

PHOTOFACT® Folder with CIRCUITRACE®

MAGNAVOX
MODEL AM-23

MAGNAVOX
MODEL AM-23

MAGNAVOX
MODEL AM-23

TRADE NAME	Magnavox Model AM-23
MANUFACTURER	The Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	9 Volts DC
RATING	5MA@9 Volts DC (No Signal, Min. Volume)
TUNING RANGE—BROADCAST	540 — 1600KC
	15MA@9 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A4....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532
A5, A6.....GENERAL CEMENT #5000, 5003, 5066, 8271, 8272, 8276, 8277, 8290, 8609, 8722, 9150, 9298
WALSCO #2515, 2516, 2518, 2519, 2525, 2541

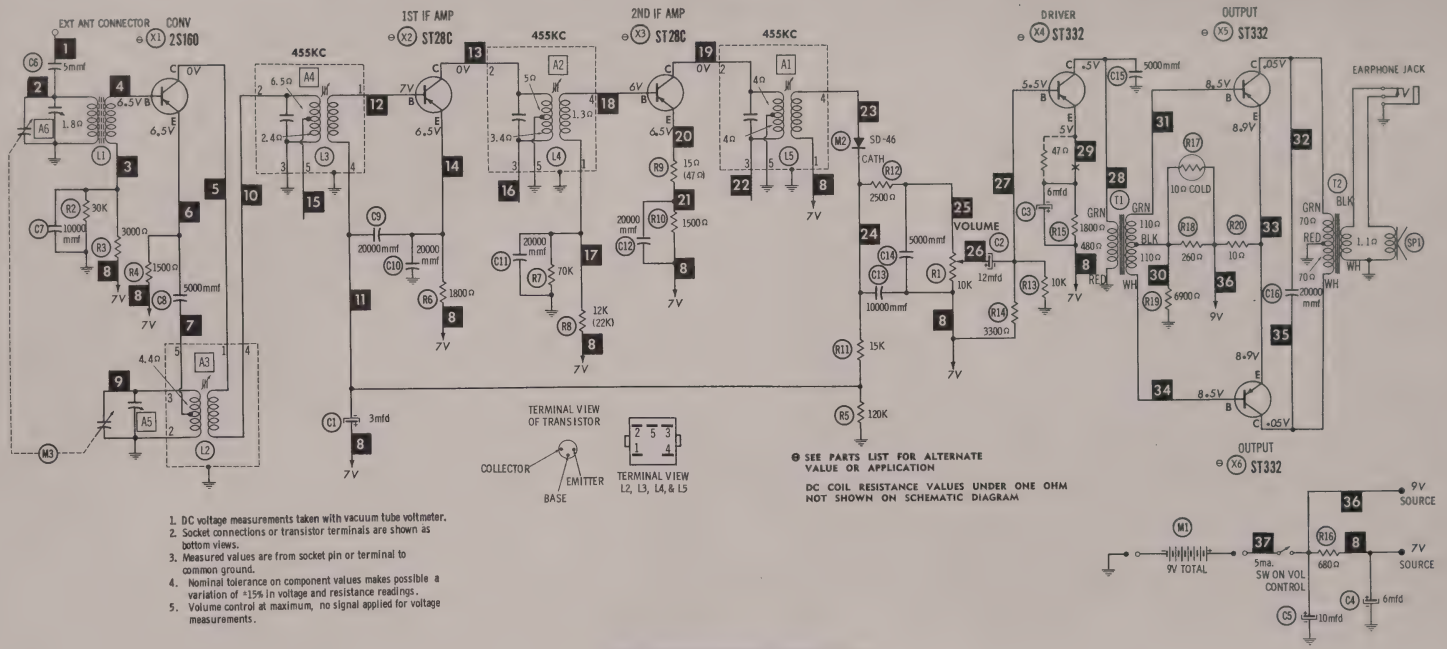
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	535KC	Tuning gang fully closed.	"	A3, A4	"
3.	"	1600KC	1600KC	"	A5, A6	Adjust for maximum output. Repeat Step 2.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF160

SET 506 FOLDER 13



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

© Howard W. Sams & Co., Inc. 1960

MAGNAVOX MODEL AM-23

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S160 ①	Converter		2N485	2N140	PNP
X2	ST28C ②	1st IF Amplifier		2N483	2N139	PNP
X3	ST28C ②	2nd IF Amplifier		2N483	2N139	PNP
X4	ST332 ③	Driver	2N406	2N362	2N109	PNP
X5	ST332 ③	Output	2N408	2N633	2N109	PNP ⎫ Matched
X6	ST332 ③	Output	2N408	2N633	2N109	PNP ⎭ Pair

① Alternate Type 2N252 may be used.
② Alternate Type 2N308 may be used.
③ Alternate Type 2N77 may be used.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	10	3	270049-1	XPP-3010	NLW10-3	TT3X10	ML10-6	TE-1053	
C2	2	12	270051-1	XPP-12002	NLW5-15	TT12X2	ML2-15	TE-1121	
C3	30	6	270054-1	PWE6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C4	30	6	270054-1	PWE6030	NLW30-6	TT6X30	ML30-6	TE-1092	
C5	20	10		XPP-10020	NLW20-15	TT15X20	ML20-15	TE-1130	①

① Some versions may use 30mfd, 6V in this application (Part #270054-1).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	5		NPO-SI 5.0	TCZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V50
C7	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C8	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C9	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C10	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C11	20000		C80V203AM	DDM-203	H-05S2		TG-120	TG-S20
C12	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C13	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C14	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C15	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C16	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	10K	1/4	220161-1	B16-216				Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	30K	
R3	3000Ω	
R4	1500Ω	
R5	120K	
R6	1800Ω	
R7	70K	
R8	12K	(22K) *

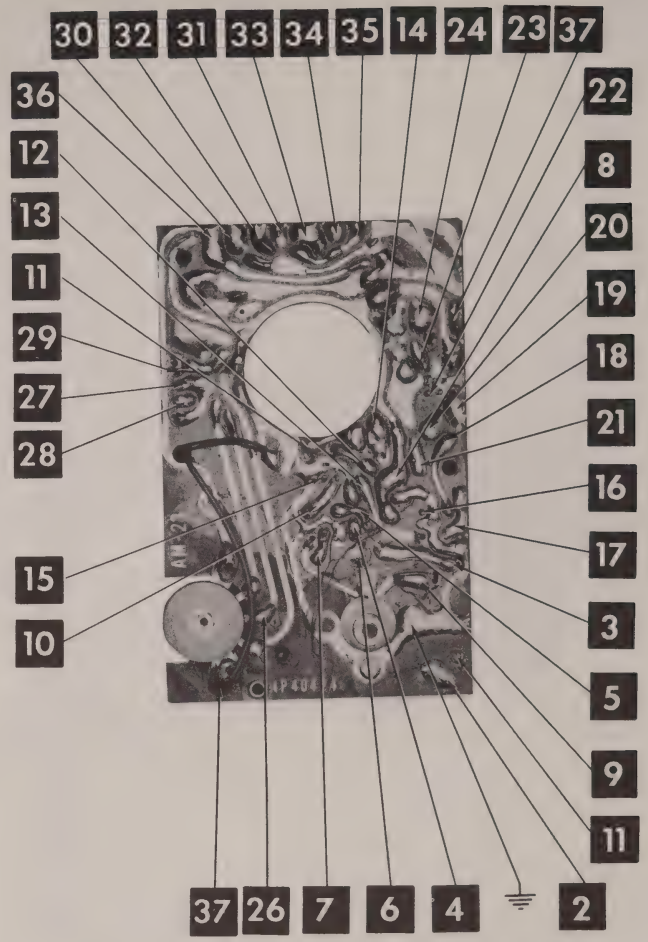
ITEM No.	RATING	REMARKS
R9	15Ω	(47Ω) *
R10	1500Ω	
R11	15K	
R12	2500Ω	
R13	10K	
R14	3300Ω	
R15	1800Ω	

ITEM No.	RATING	REMARKS
R16	680Ω	
R17	10Ω Cold	Pt. #230132-1
R18	260Ω	
R19	6900Ω	
R20	10Ω	

* Alternate Value.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo



MAGNAVOX
MODEL AM-23

FOLDER 13

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MAGNAVOX PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	360828-1					
L2	Osc. Coil	360829-1					
L3	1st IF Trans.	360836-1					
L4	2nd IF Trans.	360836-2					
L5	3rd IF Trans.	360836-3					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1, 2	1	360830-1					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	800Ω CT	6-8Ω	320291-1						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MAGNAVOX PART No.	QUAM PART No.	
SP1	2 1/4"	PM	6-8Ω	580064-1		

BATTERIES

ITEM No.	VOLTAGE	MAGNAVOX PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			2U6		216		M-1604	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	SD-46		1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

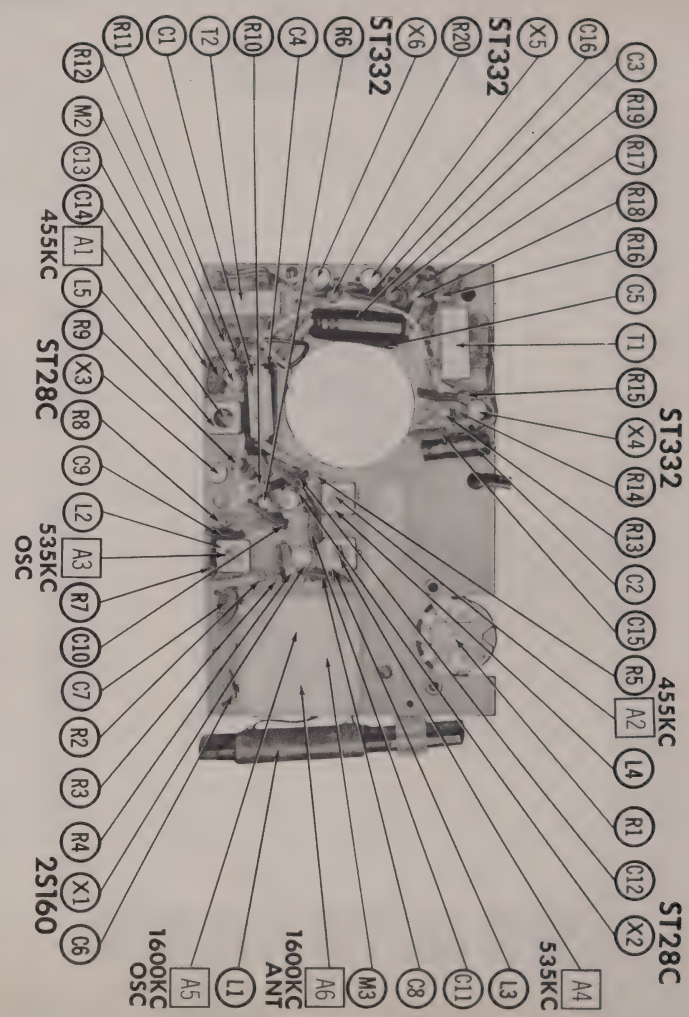
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M3	Tuning Cap.	260157-1	2 Gang
	Printed Board	210061-1	
	Antenna	700856-1	Telescoping

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	140395-1	Tuning
Knob	140396-1	Volume
Cabinet	140394-1	Blue, Includes Back
Cabinet	140394-2	Ivory, Includes Back
Cabinet Back	140403-1	Blue
Cabinet Back	140403-2	Ivory
Carrying Case	400298-1	Leather

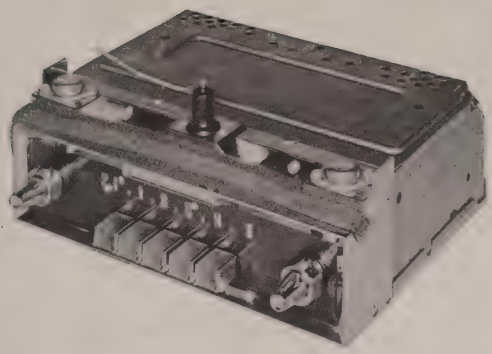
CHASSIS—TOP VIEW



PHOTOFACT® Folder with CIRCUITRACE®

MOPAR MODEL 302

MOPAR
MODEL 302



TRADE NAME	Mopar Model 302 (For PD1, PD2, PD3, PD4 1960 Dodge Automobiles)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 4 Tube, 3 Transistor Custom Built Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery RATING 1.8 Amp. @12.6 Volts DC
TUNING RANGE—BROADCAST	540-1610KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Suggested Alignment Tools:
A1, A2, A3, A4.... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6..... GENERAL CEMENT #5000, 5003, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537
A8, A9, A10..... See Fig. 2

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400∿ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Thru dummy (Fig. 1) to antenna receptacle.	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores (A8, A9, A10) out of tuning coils. Repeat Step 2.					
3.	Thru dummy to antenna receptacle.	1020KC	Tuner carriage 49/64" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	1000KC	1000KC Signal.	"		Adjust pointer adjusting cam until pointer coincides with 1000 on dial.
5.	With radio installed in car and antenna fully extended, tune in a weak station near 1000KC and adjust A7 for maximum output.					

PUSHBUTTON ADJUSTMENT

1. Pull pushbutton out.
2. Tune manually to desired station.
3. Press pushbutton in firmly.
4. Repeat for remaining pushbuttons.

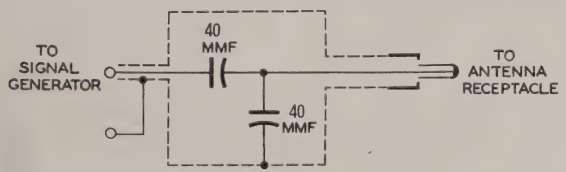


FIG. 1

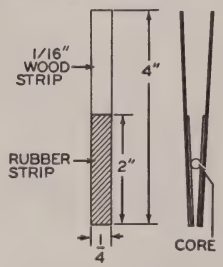


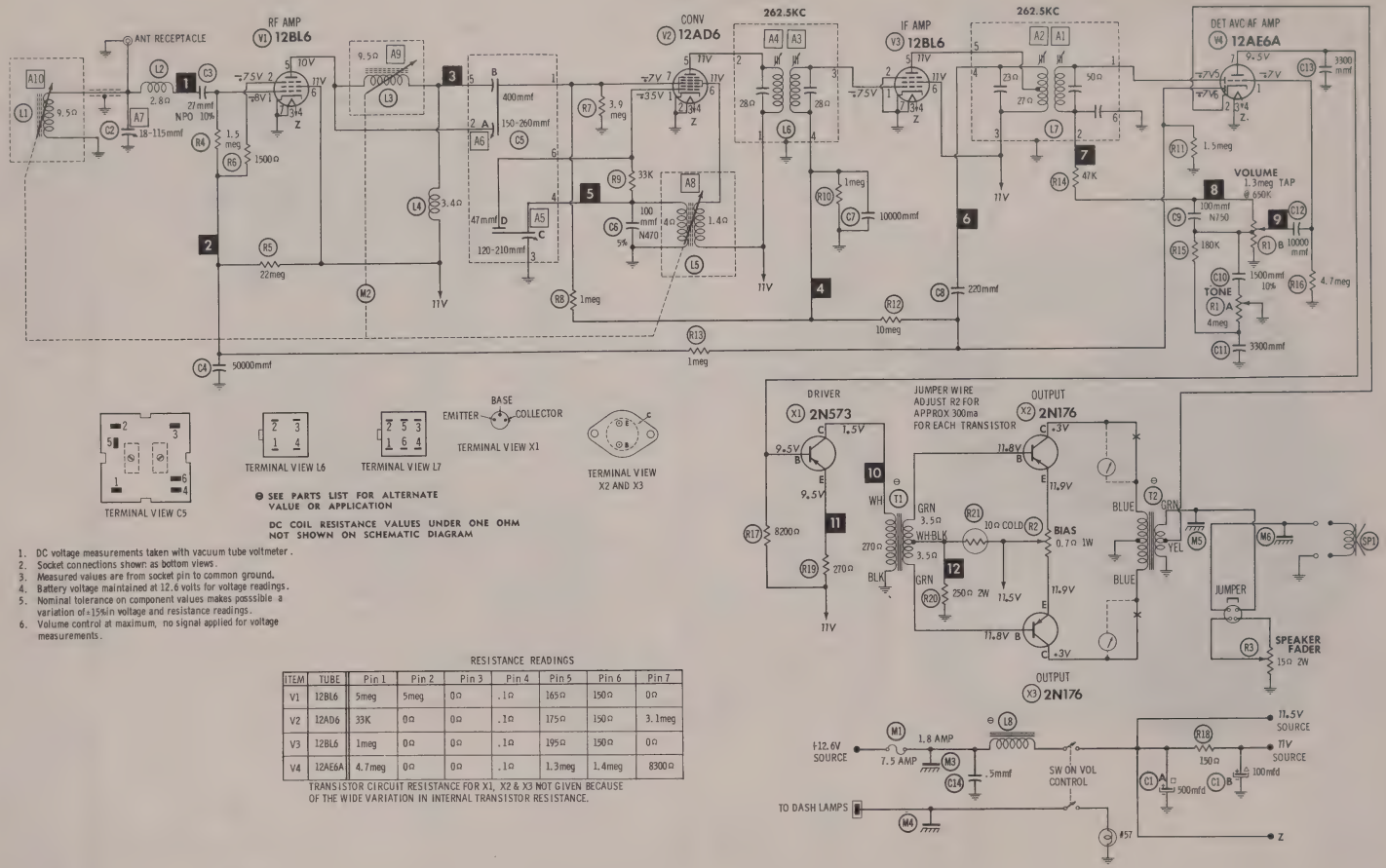
FIG. 2

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD063

SET 506 FOLDER 14



SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BL6	5meg	5meg	0Ω	.1Ω	165Ω	150Ω	0Ω
V2	12AD6	33K	0Ω	0Ω	.1Ω	175Ω	150Ω	3.1meg
V3	12BL6	1meg	0Ω	0Ω	.1Ω	195Ω	150Ω	0Ω
V4	12AE6A	4.7meg	0Ω	0Ω	.1Ω	1.3meg	1.4meg	8300Ω

TRANSISTOR CIRCUIT RESISTANCE FOR X1, X2 & X3 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
with CIRCUITRACE®

©Howard W. Sams & Co., Inc. 1960

MOPAR
MODEL 302

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	RF Amplifier	12BL6	V3	IF Amplifier	12BL6
V2	Converter	12AD6	V4	Det. -AVC-AF Amp.	12AE6A

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N573	Driver		2N573	2N573	PNP
X2	2N176	Output			2N176	PNP
X3	2N176	Output			2N176	PNP

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■500	16	23K563624	PWH2-02-75	B0045	PWP200.6		PCLS-2175 *	
B	▲100	16							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	18-115	#20K542026				302-M		
C3	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C4	50000		BPD-05	DD-503	H-05S5	IDP-2-503	GP150	5HK-S50
C5A	150-260							
B	400	#20B563442	DI-390	DD-401	L10T4	CCD-401	GP340	10TS-T40
C	120-210							
D	47		NPO-DI 47	DTZ-47	C10Q47C	CCTO-470	CNO-447	10TCC-Q47
C6	100 N470 5%	#21R129849				*		
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	220		DI-220	DD-221	L10T22	CCD-221	B-322	10TS-T22
C9	100 N750		N750-DI 100	DTN-100	C10T1U	CCTN-101	CN7-310	10TCU-T10
C10	1500 10%		DI-1500	DD-152	1R5D15	CCD-152	JL-215	10TS-D15
C11	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C14	.5 100V		P288N-5		CUB2P5	IDP-2-503	GEM-205	2TM-P5

\# Motorola Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

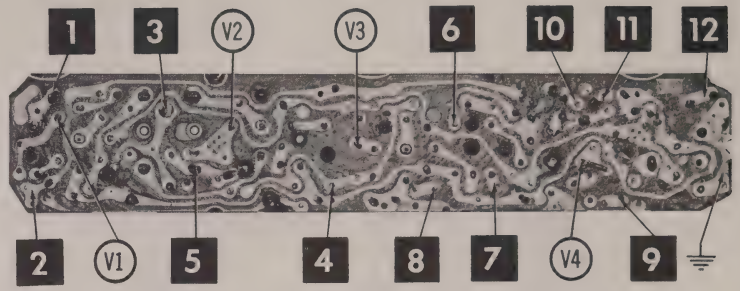
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	4meg	½	18K563448				■ UE4142S	Tone Volume
B	1.3meg 650K Tap	½						
C	Switch							Power Off-On Bias Speaker Fader
R2	0.7Ω *	1(WW)	18B563623					
R3	15Ω	2(WW)	18B563059					

* Stops Ⓐ 0.1Ω and 0.6Ω. Some versions may use .5Ω control with stops .1Ω from each end.
■ "STA-LOC" equivalent: FB46R, RU16T654, OS1875A, IS2375, US42.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE® Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1.5meg	
R5	22meg	
R6	1500Ω	
R7	3.9meg	
R8	1meg	
R9	33K	

ITEM No.	RATING	REMARKS
R10	1meg	
R11	1.5meg	
R12	18meg	
R13	1meg	
R14	47K	
R15	180K	

ITEM No.	RATING	REMARKS
R16	4.7meg	
R17	8200Ω	
R18	150Ω	
R19	270Ω	
R20	250Ω 2W	Pt.#6B563379
R21	10Ω Cold	Pt.#6K540634

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Ant. Coil	24C536308					
L2	RF Choke	24K563490	TV-180	6176	VP-1	RTC-8593	31uh
L3	RF Coil	24C536308					
L4	Image Trap	24K564146	TV-180	4628	VP-1	RTC-8667	42uh
L5	Osc. Coil	24B536300					
L6	Input IF Trans.	24K564120					
L7	Output IF Trans.	24D563300					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MOTOROLA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L8	1.8A	.2Ω	.002HY	25C563446-B ①						

① Alternate Part #25C563446.

MOPAR MODEL 302

FOLDER 14

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	5.7	1	25C563571-C ①					

① Alternate Part #25C563571.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.[1]	MOTOROLA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	30Ω CT	3-4Ω SEC. 2	25C563570-D ①						

① Alternate Part #25C563570.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	6"x 9"	PM	3-4Ω	50D562404	69A3	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	7½A 32V	65R122346	9K563698	30707.5 (SFE 7½A 32V	155009	SFE 7½	HRH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77K563581	Complete (AT-294)
M3	Spark Plate	64K530177	
M4	Spark Plate	64K561876	
M5	Spark Plate	64K563952	
M6	Spark Plate	64K530177	

CABINETS & CABINET PARTS

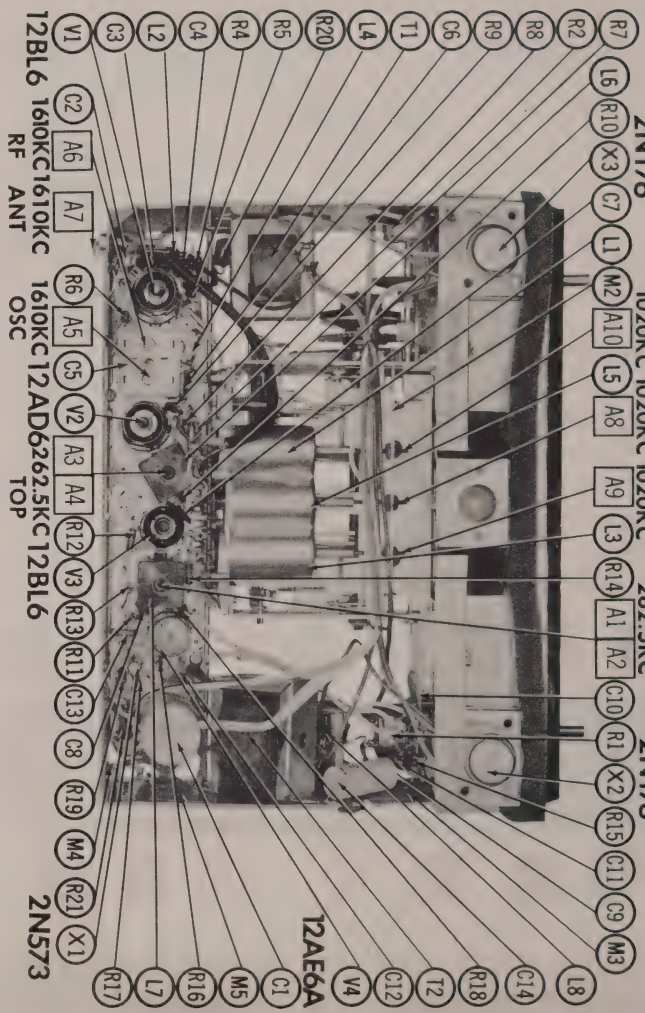
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Scale	34C562637	
Dial Pointer	52A562783	
Dial Pointer	1A562784	Arm Assembly, Includes Stud
Knob	36C563058	Tuning, Volume
Knob	36C563057	Tone, Speaker
Pushbutton	1B563641	5 Used
Pushbutton	1C538099	Arm Assembly

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire	Use BELDEN No. 8885
Bonding Strap	Use BELDEN No. 8661

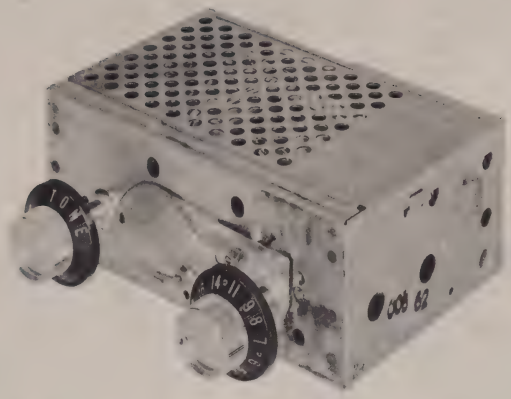
CHASSIS—TOP VIEW



PHOTOFACT® Folder

**MOTOROLA
MODEL 601X**

MOTOROLA
MODEL 601X



TRADE NAME	Motorola Model 601X
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated 3 Tube, 2 Transistor Universal Type Automobile AM Receiver
POWER SUPPLY	12 Volt Storage Battery
TUNING RANGE—BROADCAST	535 — 1610KC RATING 1.2 Amp. @ 12.6 Volts DC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4..... GENERAL CEMENT #8282, 8606, 8606-L, 9295, 9440
WALSCO #2526, 2543, 2544, 2545
A5, A6, A7.... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520
A8, A9, A10... GENERAL CEMENT #9050-L, 9150
WALSCO #2521, 2524

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to antenna receptacle. Low side to chassis.	262.5KC (400∿ Mod.)	High end stop.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Antenna receptacle thru dummy (Fig. 1).	1610KC	"	"	A5, A6, A7	"
	Step 3 is not necessary unless tuner has been tampered with or associated components have been replaced. If necessary, back tuning cores out of coils but not out of coil forms. Repeat Step 2.					
3.	Antenna receptacle thru dummy (Fig. 1).	1200KC	Tuner carriage 9/32" from high end stop.	Across voice coil.	A8, A9, A10	Adjust for maximum output. Repeat Steps 2 and 3.
4.	With radio installed in car and antenna fully extended, tune in a weak station near 1400KC and adjust A7 for maximum output.					

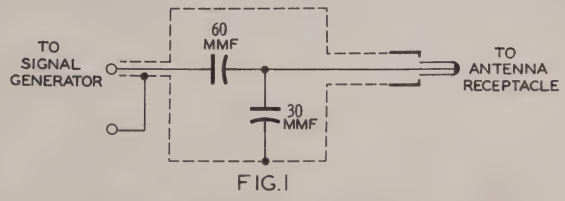


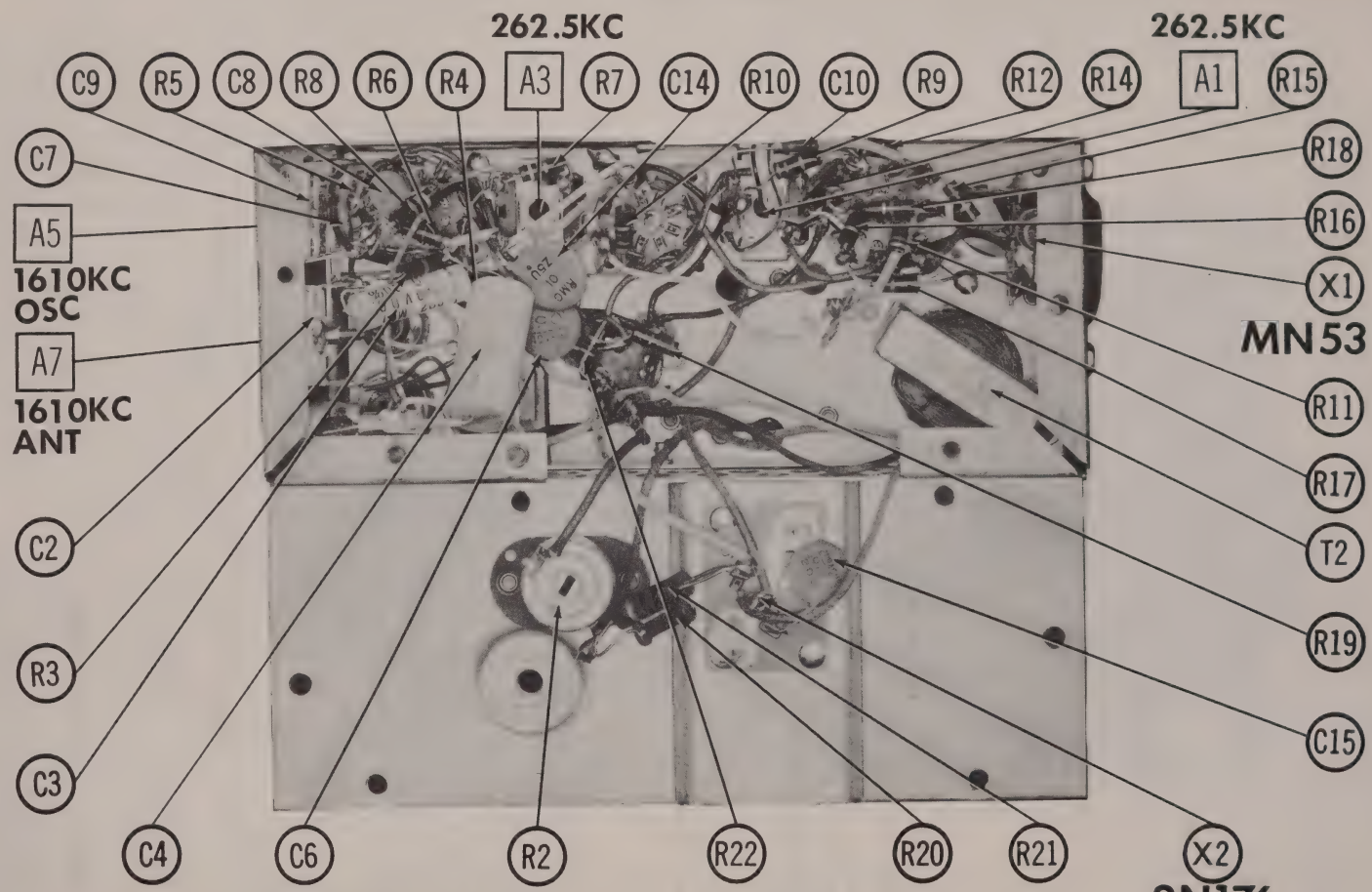
FIG. 1

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KD136

SET 506 FOLDER 15



CHASSIS - END VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1 V2	RF Amp.-Conv. IF Amplifier	12FX8 12BL6	V3	Det.-AVC-AF Amp.	12F8

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1 X2	MN53 2N176	Driver Output	2N591	MN53	2N591 2N176	PNP PNP Note 1

Note 1. When replacing, apply DC-4 grease (Part #1IM690487) or equivalent to both sides of insulator. Tighten mounting screws securely.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A B C	■500 ▲500 100	16 16 16	23B543279	AFH3-00-95	C0005	WP300.85		TVLS-3026.8*	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	40-430	#20A542758						
C3	.002 1000V		P1088N-002	DD-202	CUB10D2	16DP-1-220	GEM-1021	10TM-D2
C4	.5 100V		P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5
C5	20-120	#20K541014				424		
C6	50000		BPD-05	DD-503	H-05S5	1DP-2-503	GP150	5HK-S5
C7	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C8	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-47	CN7-447	10TCU-Q47
C9	395-470	#20A485708						
C10	27 NPO 10%		NPO-DI 25	TCZ-27	C10Q27C	CCTO-270	CNO-427	10TCC-Q27
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	2000 10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	25000				DPMS6S25	4DP-2-253	GEM-4125	5HK-S25
C16		#21A560232						

Motorola Part Number.

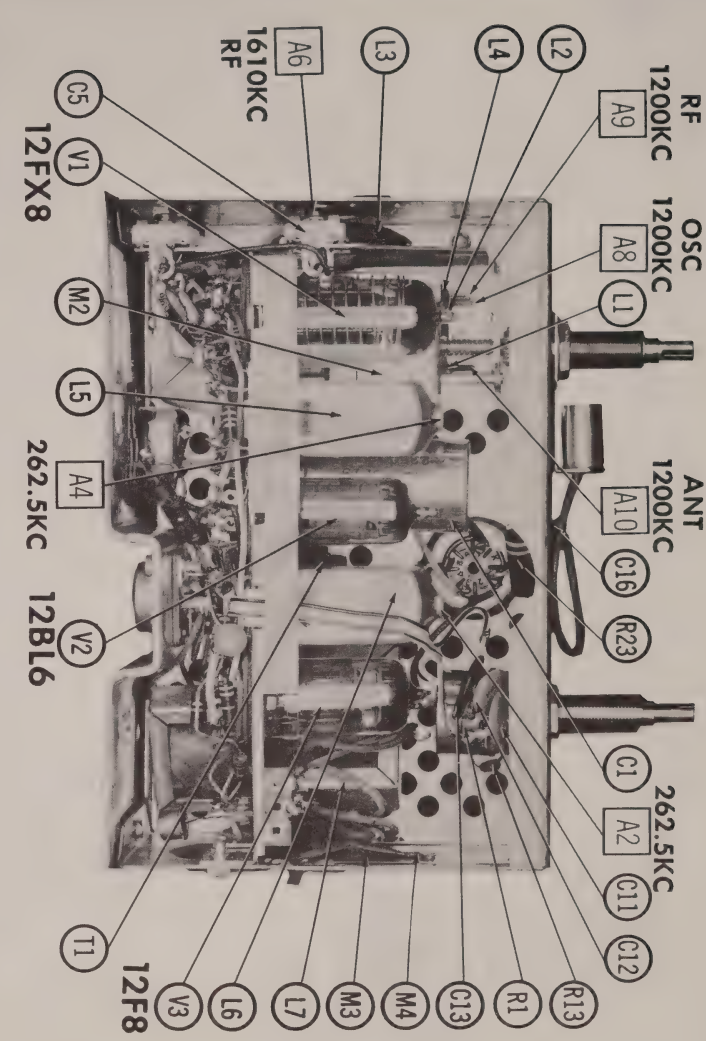
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	18C543812	F1-68	RTV-706	† QJ-1349A	■ UE4162S	Tone
B	2meg 1meg Tap	1/2		R2-75	Not Req.			Volume
C	Bushing				AK-26			
D	Switch				KR-4			Power Off-On
R2	300Ω	2(WW)	18K543840		Not Req.			Bias

† "CONCENTRIKIT" equivalent: K-8 kit with base elements & shafts: B13-139, P13-104 (Panel); B18-139X, R1-113 (Rear); S7 (Bushing); 76-1 (Switch)

■ "STA-LOC" equivalent: FY26A, RU26T16, OS1187, IS1562, US41.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	22K	
R4	1meg	
R5	3300Ω	
R6	1meg	
R7	390K	Note 1
R8	47K	
R9	3.3meg	

ITEM No.	RATING	REMARKS
R10	330Ω	*(470Ω) *
R11	4.7meg	
R12	4.7meg	
R13	100K	
R14	3.3meg	
R15	3300Ω	
R16	100Ω	

ITEM No.	RATING	REMARKS
R17	15K	
R18	22K	
R19	820Ω	
R20	10Ω Cold	Pt. #6K543800
R21	10Ω 1W	
R22	270Ω	
R23	47Ω 2W	

* Alternate Value.

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		MOTOROLA PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Ant. Coil	24B560429 ♦					
L2	RF Coil	24B560432					
L3	RF Choke	24K539955 †					
L4	Osc. Coil	24B560425 *					
L5	Input IF Trans.	24B543286	BC-350	12-H1	RF-3	RTC-8638	
L6	Output IF Trans.	24K543287	BC-354	12-H6		RTC-8640	

† Includes Capacitor.

♦ Replace with Part #24K560430.

* Replace with Part #24B560426.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	MOTOROLA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L7	1.2A	.6Ω	.002 HY	25K543844						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5	1	25K543841					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	25Ω	3-4Ω	25K543843B①						

① Alternate Part #25K543843.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	5"x 7"	PM	3-4Ω	50C541964	57A21	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	SFE	9A 32V	65K16248	1V541705	307009 (SFE 9A 32V)	155009	SFE 9	HRH

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M2	Tuner	77K560779	MT-244, Complete (Requires 2 insulating rivets Part #5K542817 for mounting tuner to housing)
M3	Spark Plate	64K530177	
M4	Spark Plate	64K530177	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

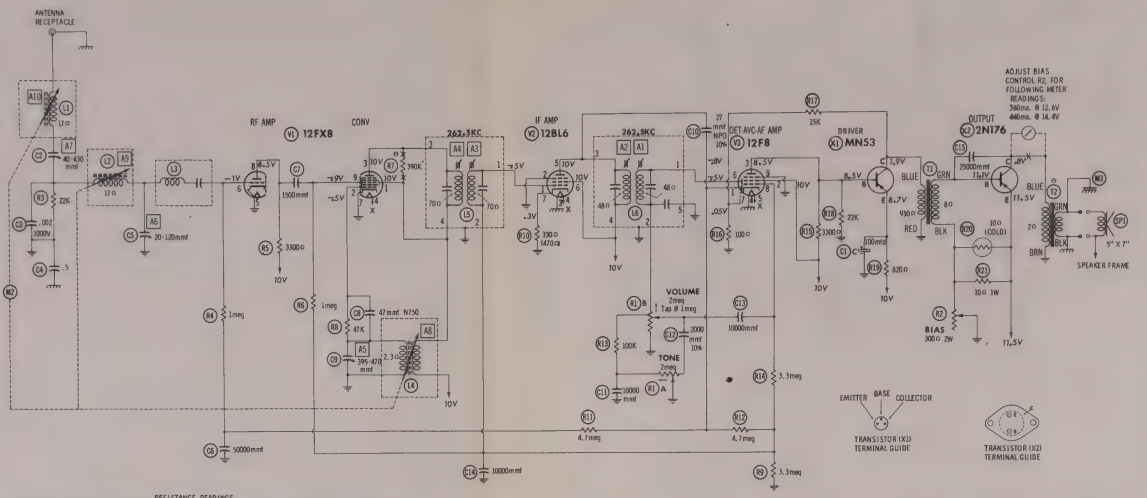
NAME	PART NO.	DESCRIPTION
Knob	36B543847	Tuning, Volume
Knob	36K543836	Tone
Knob	36C543835	Dial

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Shielded Hook-up Wire ..... Use BELDEN No. 8885

Bonding Strap ..... Use BELDEN No. 8661

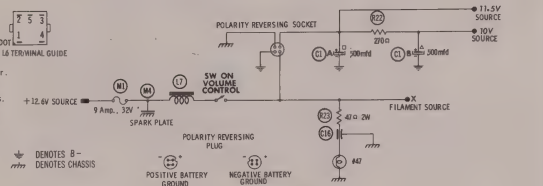


RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12FX8	270Ω	47K	340Ω	.4Ω	0Ω	13.7meg	0Ω	3600Ω	4.3meg
V2	12BL6	3.3meg	0Ω	0Ω	.4Ω	315Ω	270Ω	330Ω		
V3	12F8	8meg	270Ω	3600Ω	0Ω	.4Ω	1.8meg	100Ω	6.6meg	0Ω

TRANSISTOR CIRCUIT RESISTANCE FOR X1 AND X2 NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

MOTOROLA MODEL 601X

PHOTOFACT® Folder

NORELCO
MODEL L3X88T

TRADE NAME	Norelco Model L3X88T
SUPPLIER	North American Philips Co., Inc., 230 Duffy Ave., Hicksville, N. Y.
TYPE SET	Battery Operated Transistorized Portable BC-SW Receiver
POWER SUPPLY	9 Volts DC — RATING 13MA @ 9 Volts DC (No Signal, Min. Volume) 50MA @ 9 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	512-1635KC — SHORT WAVE 4.65 – 12.2MC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A7, A9, A13, ... GENERAL CEMENT #8721, 8722
WALSCO #2519

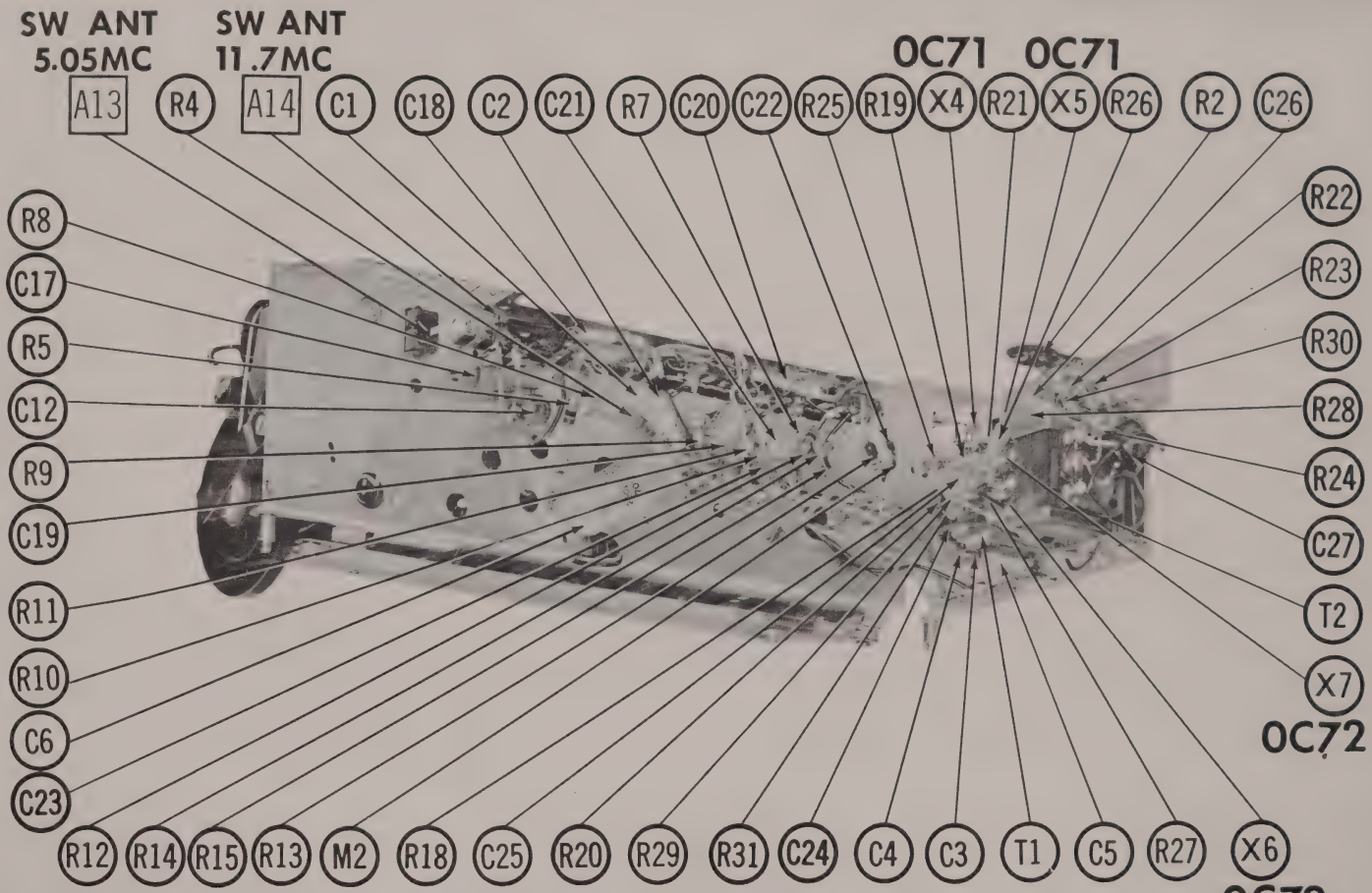
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	452KC (400∿ Mod.)	(BC) Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4, A5, A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	512KC	(BC) Tuning gang fully closed.	"	A7	"
3.	"	1635KC	(BC) Tuning gang fully open.	"	A8	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	4.65MC	(SW) Tuning gang fully closed.	"	A9	Adjust for maximum output.
5.	"	12.2MC	(SW) Tuning gang fully open.	"	A10	Adjust for maximum output. Repeat Steps 4 and 5.
6.	"	600KC	(BC) 600KC Signal.	"	A11	Adjust for maximum output.
7.	"	1500KC	(BC) 1500KC Signal.	"	A12	Adjust for maximum output. Repeat Steps 6 and 7.
8.	"	5.05MC	(SW) 5.05MC Signal	"	A13	Adjust for maximum output.
9.	"	11.7MC	(SW) 11.7MC Signal.	"	A14	Adjust for maximum output. Repeat Steps 8 and 9.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF124

NORELCO
MODEL L3X88T
NORELCO
MODEL L3X88T
SET 506 FOLDER 16



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	OC170①	Converter	2N371		2N371	PNP
X2	OC45②	1st IF Amplifier	2N410	2N483	2N410	PNP
X3	OC45②	2nd IF Amplifier	2N410	2N483	2N410	PNP
X4	OC71	AF Amplifier	2N406	2N362		PNP
X5	OC71	Driver	2N406	2N362		PNP
X6	OC72	Output	2N408	2N360		PNP Matched
X7	OC72	Output	2N408	2N360		PNP Pair

① Alternate Type 2N371 may be used.
② Alternate Type 2N410 may be used.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	NORELCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	3.2	70	909/E3.2	PRS1400	NLW3-100	TT80X4	TD-4-150	TE-1403	
C2	50	12.5	909/B50	XPP-15050	BBR50-25	TT15X50	ML50-15	TE-1160	
C3	16	12.5	AC5703/16	XPP-25015	NLW15-25	TT25X15	ML15-25	TE-1205	
C4	16	12.5	AC5703/16	XPP-25015	NLW15-25	TT25X15	ML15-25	TE-1205	
C5	100	12.5	909/B100	PRS1200	BBR100-25	TC2501	ML100-25	TE-1211	
C6	250	12.5	910/B250	PRS1210	BR2502	TC50025	TD-250-15	TE-1138	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

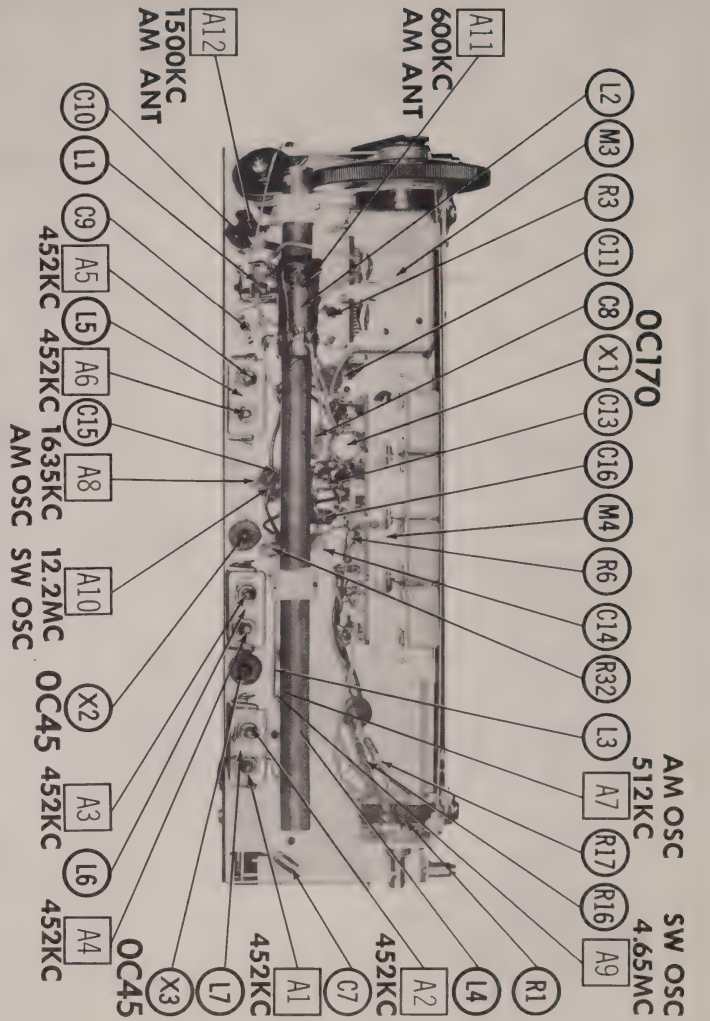
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	430			DD-471	L10T42	CCD-471	B-347	10TS-T47
C8	10 N750 10%		N750-SI 10	TCN-10	C10Q10U	CCTN-100	CN7-410	10TCU-Q10
C9	20	*						
C10	30	*						
C11	3000 5%				1R5D33	CM-19B-302J	MCE461	MS-23
C12	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C13	30	*						
C14	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	30	*						
C16	1500 2.5%					CM-20C-152G	MCE456	
C17	1000 2.5%					CM-20E-102G	MCE255	
C18	50	*						
C19	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C20	50	*						
C21	.22 125V		P288N-22		CUB2P22	2DP-4-224	GEM-2022	2TM-P22
C22	2200		SI 2200	DD-222	BYA10D22	CCD-222	B-222	5HK-D22
C23	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C24	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C25	.047 125V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C26	330 N750		N750-SI 330	TCN-330	C10T33U		CN7-333	10TCU-T33
C27	.033 250V 10%		V84C4S33-10%		PM6S33	4DP-2-333	GEM-1613	6TM-S33

* Nominal Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	NORELCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	20K 4000Ω Tap	½	B163965					Volume
R2	2000Ω	½	B151422					Bias

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	680Ω	Note 1
R4	2200Ω	
R5	10K	
R6	2700Ω	
R7	10K	
R8	180K	
R9	680Ω	
R10	3900Ω	
R11	22K	
R12	1000Ω	

ITEM No.	RATING	REMARKS
R13	15K	
R14	390Ω	
R15	22K	
R16	1500Ω	
R17	2200Ω	
R18	18K	
R19	33K	
R20	1200Ω	
R21	1800Ω	
R22	6800Ω	

ITEM No.	RATING	REMARKS
R23	10K	
R24	4700Ω	
R25	1500Ω	
R26	1500Ω	
R27	56Ω	
R28	15Ω	
R29	330Ω	
R30	10K	
R31	220Ω	
R32	33K	Note 1

Note 1. Not used in some versions.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		NORELCO PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	SW Ant. Trans.	A380470					
L2	Loopstick	A380408					
L3	SW Osc. Coil	A312926					
L4	BC Osc. Coil	A312881					
L5	1st IF Trans.	A312884					
L6	2nd IF Trans.	A312842					
L7	3rd IF Trans.	A312841					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	NORELCO PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.3	1	A316206					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	NORELCO PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	36Ω CT	3-4Ω	918108						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	NORELCO PART No.	QUAM PART No.	
SP1	4"x 6"	PM	3-4Ω	AD3460Z	46A15Z3.8	

BATTERIES

ITEM No.	VOLTAGE	NORELCO PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			230 *		A100 *		M-13R *	* 6 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		NORELCO PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	0A79		1N295	1N295	Detector (Pigtail)

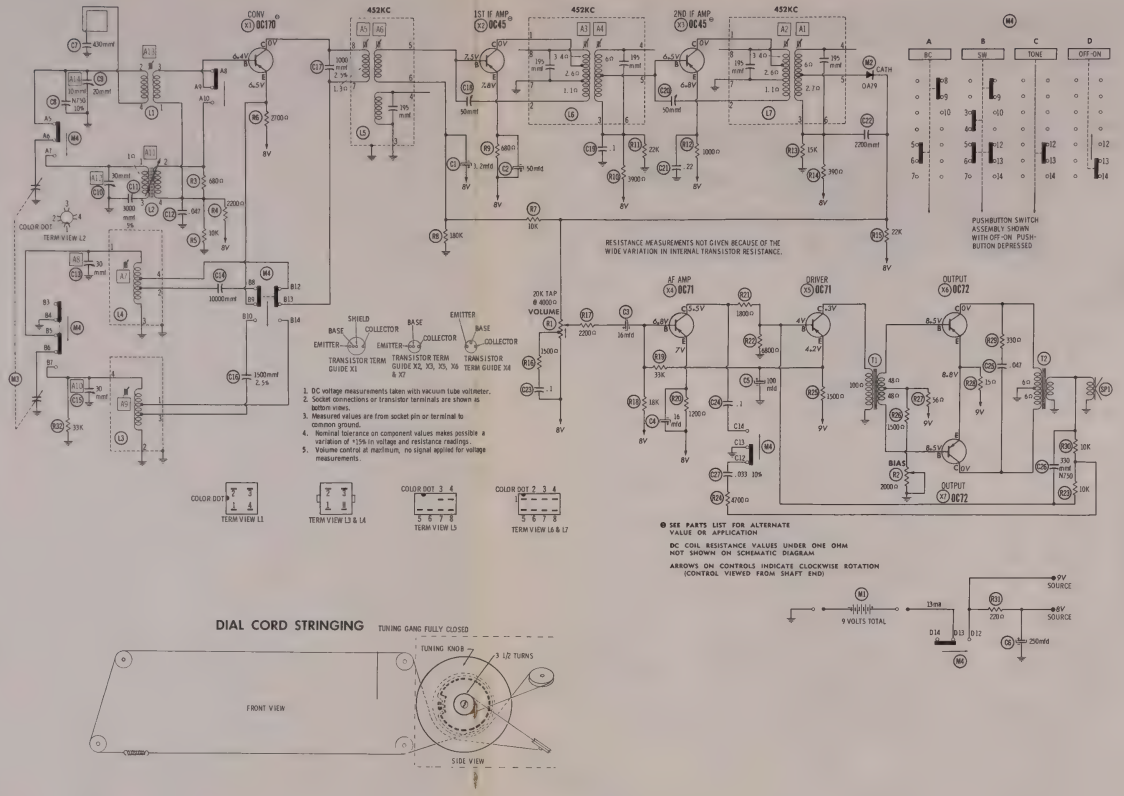
MISCELLANEOUS

ITEM No.	PART NAME	NORELCO PART No.	NOTES
M3	Tuning Cap.	4900204	2 Gang (Ant. 8-533mmf, Osc. 7-151mmf)
M4	Switch	A379210	Pushbutton Assembly; Includes off switch, Tone, Short Wave, AM.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	P407771/799	Tuning
Knob	P407740/799	Volume
Dial (S)	A395584	
Dial (OV)	A395585	
Dial (Can.)	A395586	
Cabinet	A378187	
Cabinet Front	P521007/159	
Cabinet Rear	P545015/159	
Handle	A367324	


CONV. X1 0C170
1ST IF AMP. X2 0C45
2ND IF AMP. X3 0C45
452KC
AF AMP X4 0C71
DRIVER X5 0C71
OUTPUT X6 0C72
OUTPUT X7 0C72
A
B
C
D
BC
SW
TONE
OFF-ON
PUSHBUTTON SWITCH ASSEMBLY SHOWN WITH OFF-ON PUSH-BUTTON DEPRESSED
RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.
20K TAP @ 4000Ω VOLUME
COLOR DOT
TERM VIEW L2
TERM VIEW L1
TERM VIEW L3 & L4
TERM VIEW L5
TERM VIEW L6 & L7
TRANSISTOR TERM GUIDE X1
TRANSISTOR TERM GUIDE X2, X3, X5, X6 & X7
TRANSISTOR TERM GUIDE X4
BIAS
1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
9 VOLTS TOTAL
9V SOURCE
8V SOURCE

DIAL CORD STRINGING

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

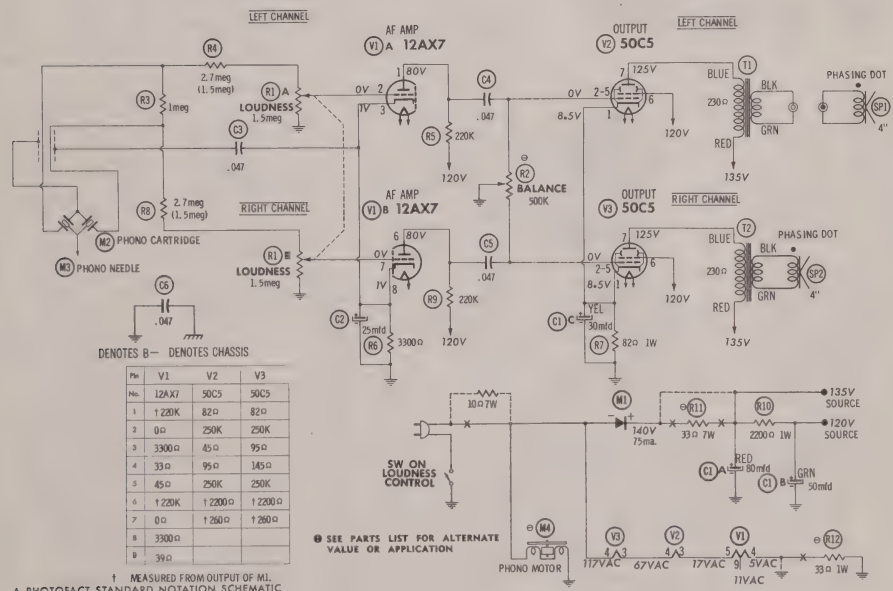
NORELCO
MODEL L3X88T

PHOTOFACT® Folder

RCA VICTOR MODEL SES2LE (Ch. RS-185)

RCA VICTOR MODEL
SES2LE (Ch. RS-185)

TRADE NAME	RCA Victor Model SES-2LE (Ch. RS-185)
MANUFACTURER	RCA Victor Radio & "Victrola" Div., Radio Corp. of America, Camden 8, N. J.
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Manual Record Player
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 34 Watts, .38 Amp. @ 117 Volts AC (Less Motor)



Pin No.	V1	V2	V3
1	†220K	82Ω	82Ω
2	0Ω	250K	250K
3	3300Ω	45Ω	95Ω
4	33Ω	95Ω	145Ω
5	45Ω	250K	250K
6	†220K	†2200Ω	†2200Ω
7	0Ω	†260Ω	†260Ω
8	3300Ω		
9	39Ω		

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

©Howard W. Sams & Co., Inc. 1960

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of KR013

the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

SET 506 FOLDER 17

PARTS LIST AND DESCRIPTIONS

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Left Channel AF Amp. - Right Channel AF Amp.	12AX7	V2 V3	Left Channel Output Right Channel Output	50C5 50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA RCA VICTOR PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A B C	80 50 30	200 150 12	108779	PR3-030	BBRT0185	WT407	TDLT-20	TVA-4708	
C2	25	6	214306	PRS1260	BBR25-6	TC26	TD-25-25	TVA-1205	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C5	.047 200V		P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47
C6	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA VICTOR PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.5meg	½	108709	B-76	AD47-1meg-Z		FA26A	Loudness, Left Channel
B	1.5meg	½		SR-76	Not Req.		RU26A	Loudness, Right Channel
C	Shaft			Not Req.	FS-3		CS3500	
D	Switch			KR-1	SWE-12		US41	Power Off-On
R2A	500K	½	108707 ①	B-617	A47-500K-S	Q11-133	U50	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

① Some versions may use Part #108708.

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	1meg	(1.5meg) *
R4	2.7meg	
R5	220K	
R6	3300Ω	

ITEM No.	RATING	REMARKS
R7	82Ω 1W	(1.5meg) *
R8	2.7meg	
R9	220K	
R10	2200Ω	

ITEM No.	RATING	REMARKS
R11	33Ω 7W	Pt. #108716 ①
R12	33Ω 1W	IRC #PW10-33Ω ①

* Alternate Value.
① Not used in late versions.

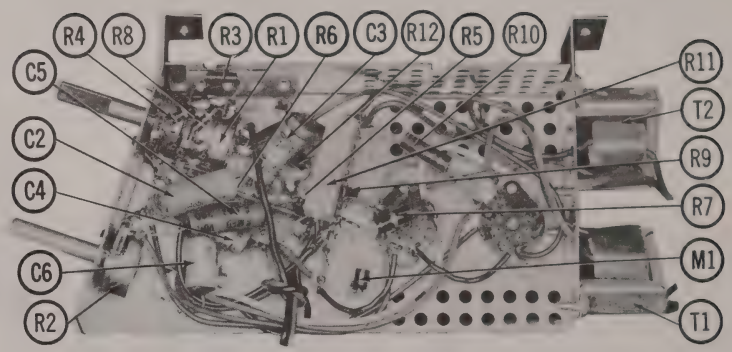
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA VICTOR PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2700Ω	3-4Ω	108687	A-3025	AU-605	A-3332	24S53	S-12X	
T2	2700Ω	3-4Ω	108687	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA VICTOR PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	79696A	4A1	
SP2	4"	PM	3-4Ω	79696A	4A1	

CHASSIS—BOTTOM VIEW



RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA RCA VICTOR PART No.	ITT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.075A	108680 *	RE504 *	1NI764 *	2F4 *	SR200 *	* Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA RCA VICTOR PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2	108213A	13TB		26V					

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA RCA VICTOR PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M3	108214 †	M-77X † or M-77XSD †♦ or M-77XDD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M4	Motor Assy. Motor Assy. Tone Arm	971580-3190 971580-3107 108787	Complete (Includes Motor #108789) Complete (Includes Motor #108789)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

STEELMAN MODELS 201, 202, 403

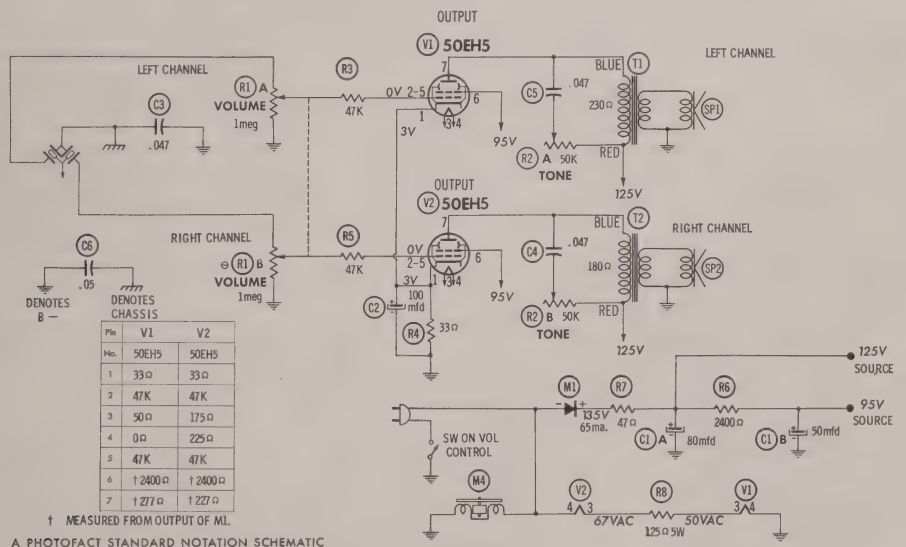
STEELMAN MODELS
201, 202, 403

MODEL 201

TRADE NAME	Steelman Models 201, 202, 403
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated 2 Tube Stereo Phono Amplifier
POWER SUPPLY	110 - 120 Volts AC, 60 Cycles RATING 39 Watts, .52 Amp. @ 117 Volts AC (Less Motor)

MODELS 201 AND 202 HAVE 4 SPEED MANUAL RECORD PLAYERS.
MODEL 403 USES 4 SPEED AUTOMATIC RECORD CHANGER PART #300415. FOR SERVICE INFORMATION — SEE MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11

STEELMAN MODELS
201, 202, 403



Pin No.	V1 50EH5	V2 50EH5
1	33Ω	33Ω
2	47K	47K
3	50Ω	175Ω
4	0Ω	225Ω
5	47K	47K
6	†2400Ω	†2400Ω
7	†277Ω	†227Ω

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

© Howard W. Sams & Co., Inc. 1960

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

STEELMAN MODELS
201, 202, 403

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JR966

SET 506 FOLDER 18

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆ USE	TYPE
V1	Left Channel Output	50EH5
V2	Right Channel Output	50EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	582004	PRS3800	BBRD8515	TCD498	TDLD-12	TVA-2462	
B	50	150							
C2	100	10	581014	PRS1150	BBR100-15	TC2501	TD-100-25	TVA-1130	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C6	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg		368063 ①	B-70	AD47-1meg-Z		FA16A	Volume, Left Channel
B	1meg			SR-70	Not Req.		RU16A	Volume, Right Channel
C	Shaft			Not Req.	KSS-3		CS3500	
D	Switch			KR-1	SWE-12		US-41	Power Off-On
R2A	50K		368064	B-32	AD47-50K-S			Tone, Left Channel
B	50K			SR-32	Not Req.			Tone, Right Channel
C	Shaft			Not Req.	KSS-3			

① Model 403 uses Part #368066 (Less Switch).

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	47K	
R4	33Ω	
R5	47K	

ITEM No.	RATING	REMARKS
R6	2400Ω	(2200Ω) *
R7	47Ω	Pt. #510028 IRC#FR-47Ω

ITEM No.	RATING	REMARKS
R8	125Ω 5W	Pt. #510005 IRC#PW5-125Ω

* Alternate Value.

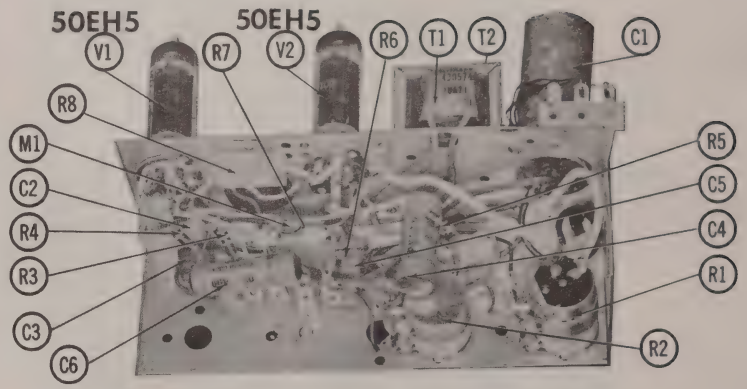
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA STEELMAN PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	4500Ω	3-4Ω	430574	A-3026	AU-601	A-3877	24S48	S-6X	
T2	4500Ω	3-4Ω	430574	A-3026	AU-601	A-3877	24S48	S-6X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	404003 *	4A07	* Model 201
SP2	4"	PM	3-4Ω	404003 *	4A07	† Models 202, 403
	4"	PM		404014 †		
	4"	PM		404015 †		

CHASSIS—BOTTOM VIEW



RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA STEELMAN PART No.	ITT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.065A	380020 *	RE504 *	1N1763 *	2F4 *	SR200 *	* Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA STEELMAN PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M2		76-TS-TB		96T				12TH-S	

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

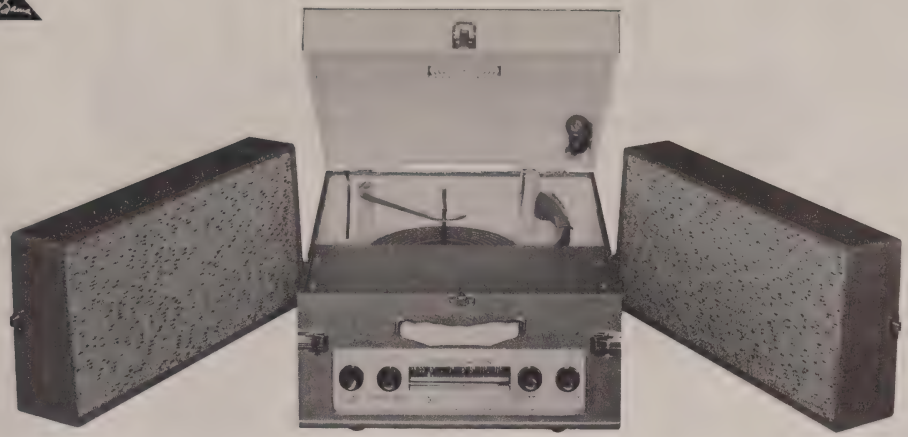
ITEM No.	REPLACEMENT DATA STEELMAN PART No.	REPLACEMENT DATA JENSEN PART No.	REMARKS
M3		VA-302 † or VA-302D ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M4	Motor	311141	Turntable Drive (4 Speed G. I.) Model 201
	Motor	311185	Turntable Drive (4 Speed G. I.) Model 202

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No.	1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No.	8401
Phono Pick-up Arm Cable	Use BELDEN No.	8430 (Two Conductor - Twisted)



TRADE NAME	Steelman Model 551
MANUFACTURER	Steelman Phono & Radio Co., 2-30 Anderson Ave., Mount Vernon, N. Y.
TYPE SET	AC Operated 6 Tube AM Receiver with 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles
TUNING RANGE	BROADCAST 535 - 1620KC RATING 48 Watts, .46 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER PART #300413 - SEE SIMILAR MONARCH UA8 - PHOTOFACT SET 381 FOLDER 11 OR RECORD CHANGER MANUAL RC-11

ALIGNMENT INSTRUCTIONS

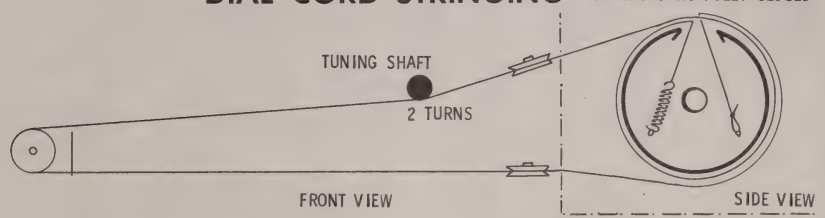
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1 thru A4 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5, A6 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	High side thru .1mfd to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1400KC	1400KC	"	A6	Adjust for maximum output while rocking tuning gang.

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KP067

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8674
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Converter	6BE6	V4	Left Channel Output	25EH5
V2	IF Amplifier	6BA6	V5	Right Channel AF Amp.	12AV6
V3	Det. - AVC - Left Channel AF Amplifier	12AV6	V6	Right Channel Output	25EH5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA STEELMAN PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	80	150	583024	PRS3800	BBRT84215	TCT3117	TDLT-7	TVA-3455	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-4147	4TM-S5
C3	100			1468-0001	TCZ-100	5W5T1	CM-19B-101M	MC235	1FM-31
C4	1000			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	100		Note 1	1468-0001	TCZ-100	5W5T1	CM-19B-101M	MC235	1FM-31
C6	5000			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C7	680			1468-00068	D6-681	5W5T68	CM-19B-681M	MCJ249	1FM-368
C8	3000			SI 3000	D6-302	BYA10D3	CCD-302	GP230	5HK-D33
C9	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C11	680			1468-00068	D6-681	5W5T68	CM-19B-681M	MCJ249	1FM-368
C12	3000			SI 3000	D6-302	BYA10D3	CCD-302	GP230	5HK-D33
C13	5000			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C14	100		Note 1	1468-0001	TCZ-100	5W5T1	CM-19B-101M	MC235	1FM-31
C15	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	10000			BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C17	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C18	.05	400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C19	.047	400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C20	.1	400V	Note 1	P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1

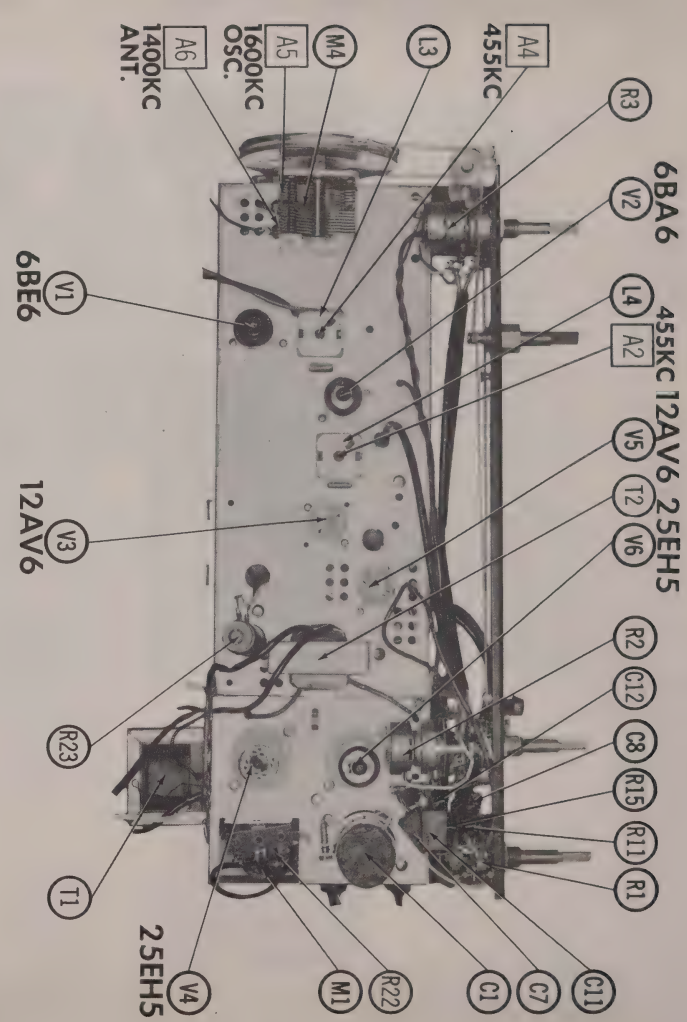
Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEELMAN PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3.25meg	1/2	368070					Loudness, Left Channel
	750K Tap							
B	3.25meg	1/2						Balance, Right Channel
	750K Tap							
R2A	Switch		368041					Selector
B	500K	1/2						Treble, Left Channel ①
C	500K	1/2						Treble, Right Channel ①
R3A	3.25meg	1/2	368042	B-85			FC36A	Bass, Right Channel
B	3.25meg	1/2		SR-85			RU36A	Bass, Left Channel
C	Shaft			Not Req.			CS3500	
D	Switch			KR-1			US41	Power Off-On

① Some versions may use 250K in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	22K	
R5	2.2meg	
R6	150Ω	
R7	1meg	
R8	470K	
R9	4.7meg	
R10	180K	(100K) *
R11	100K	

ITEM No.	RATING	REMARKS
R12	470K	
R13	68Ω	
R14	180K	(100K) *
R15	100K	
R16	4.7meg	
R17	470K	
R18	470K	
R19	68Ω	

ITEM No.	RATING	REMARKS
R20	1000Ω 1W	
R21	220Ω 3W	Pt. #510007 IRC #PW5-220Ω
R22	47Ω 5W	Pt. #510028 IRC #FR-47Ω
R23	140Ω 20W	Pt. #510035 IRC #2DA-140Ω

* Alternate Value

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		STEELMAN PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	464028					
L2	Osc. Coil	455075	BC-393	69-OSC		RTC-8646	
L3	Input IF Trans.	450023	BC-352	12-C1	RF-1	RTC-8632	
L4	Output IF Trans.	450023	BC-353	12-C2	RF-2	RTC-8633	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2800Ω	3-4Ω	430566	A-2928	AU-603	A-3876	22S46	S-1X	
T2	2800Ω	3-4Ω	430566	A-2928	AU-603	A-3876	22S46	S-1X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω	406006	6A21	
SP2	6"	PM	3-4Ω	406006	6A21	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	STEELMAN PART No.	ITT PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.085A	380020 *	RE504 *	1N1763 *	2F4 *	SR200 *	* Silicon

PHONO CARTRIDGE

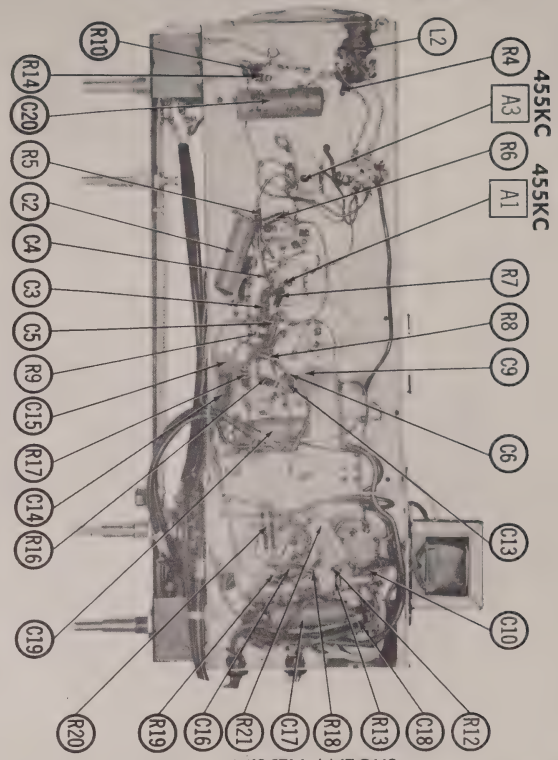
ITEM No.	REPLACEMENT DATA								
	STEELMAN PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2		76-TS-TB		26S	S1-1 S3-3	53	J-43 & J-47X	8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA		REMARKS
	STEELMAN PART No.	JENSEN PART No.	
M3		CRA-55 † or CRA-55D ♦ and CRA-55X † or CRA-55XD ♦	† Jewel ♦ Diamond

CHASSIS—BOTTOM VIEW



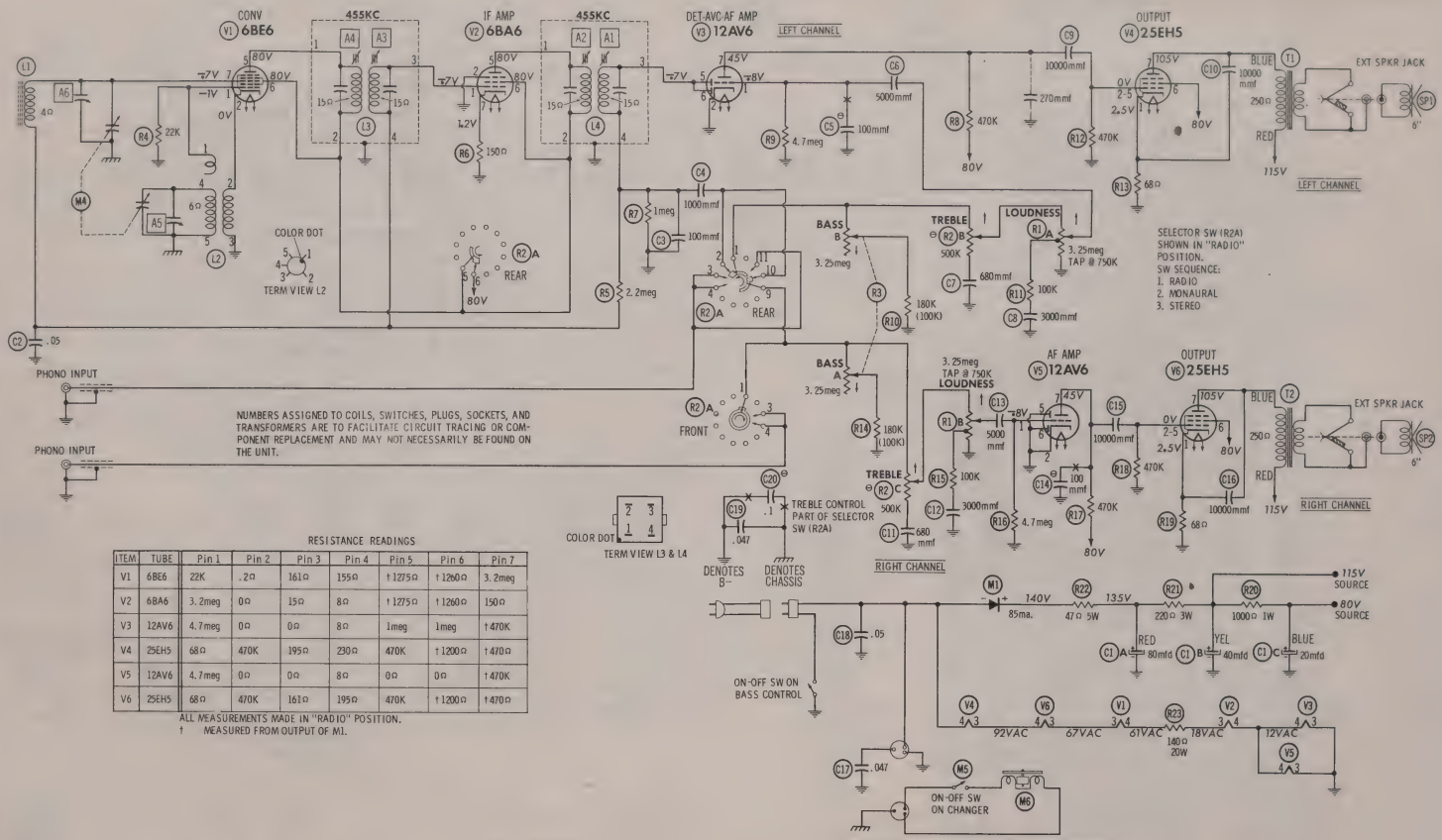
MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M4	Tuning Cap.	590054	2 Gang (Ant. 17-290mmf, Osc. 29-170mmf)
M5	Switch		Changer Off-On (Part of Changer)
M6	Motor		Phono Drive (Part of Changer)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Dial Glass	800177	With Artwork
Knob	272272	Tuning, Volume, Dummy Dual
Knob	272267	Function, Clutch, Top
Knob	272293	Function, Clutch, Bottom
Cabinet	241630	Tan & White



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	6BE6	22K	.2Ω	161Ω	155Ω	†1275Ω	†1260Ω	3.2meg
V2	6BA6	3.2meg	0Ω	15Ω	8Ω	†1275Ω	†1260Ω	150Ω
V3	12AV6	4.7meg	0Ω	0Ω	8Ω	1meg	1meg	†470K
V4	25EH5	68Ω	470K	195Ω	230Ω	470K	†1200Ω	†470Ω
V5	12AV6	4.7meg	0Ω	0Ω	8Ω	0Ω	0Ω	†470K
V6	25EH5	68Ω	470K	161Ω	195Ω	470K	†1200Ω	†470Ω

ALL MEASUREMENTS MADE IN "RADIO" POSITION.
† MEASURED FROM OUTPUT OF M1.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

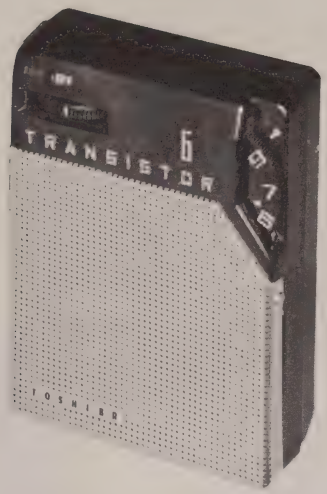
© Howard W. Sams & Co., Inc. 1960

STEELMAN MODEL 551

PHOTOFACT® Folder with CIRCUITRACE*

TOSHIBA
MODEL 6TP-354

TOSHIBA
MODEL 6TP-354



TOSHIBA
MODEL 6TP-354

TRADE NAME	Toshiba Model 6TP-354
IMPORTER	Transistor World Corp., 52 Broadway, New York 4, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	4.5 Volts DC
RATING	7MA@4.5 Volts DC (No Signal, Min. Volume) 10MA@4.5 Volts DC (Signal, Normal Volume)
TUNING RANGE—BROADCAST	540 - 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3, A5....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8729, 8987, 8988, 8989
WALSCO #2515, 2531, 2532

A4, A6.....GENERAL CEMENT #5000, 5003, 5066, 8276, 8290, 9087, 9089
WALSCO #2512, 2525, 2528

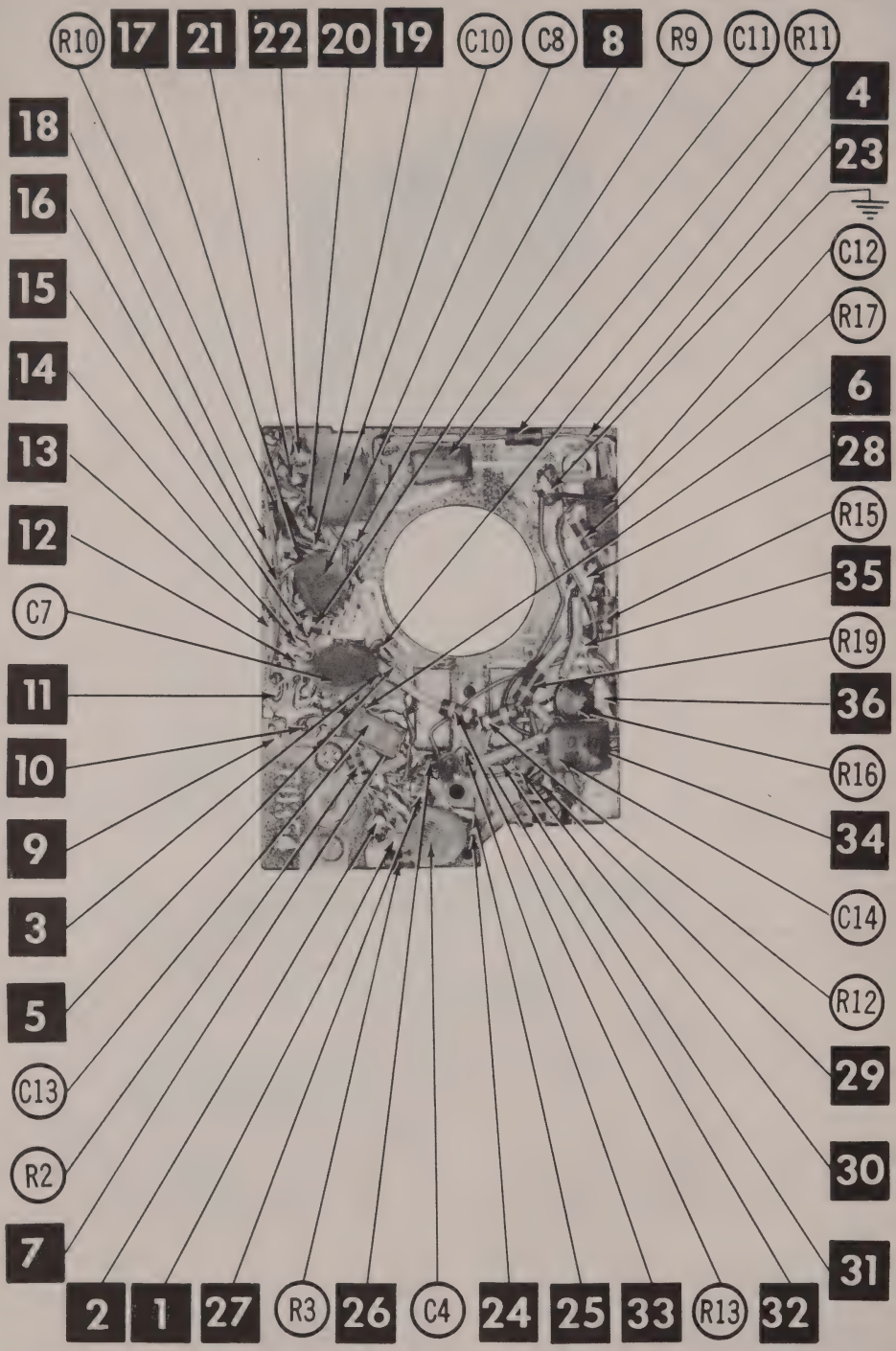
	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Loop	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.	"	1600KC	1600KC	"	A4	"
3.	"	600KC	600KC Signal.	"	A5	"
4.	"	1400KC	1400KC Signal.	"	A6	Adjust for maximum output while rocking tuning gang.

SET 506 FOLDER 20

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

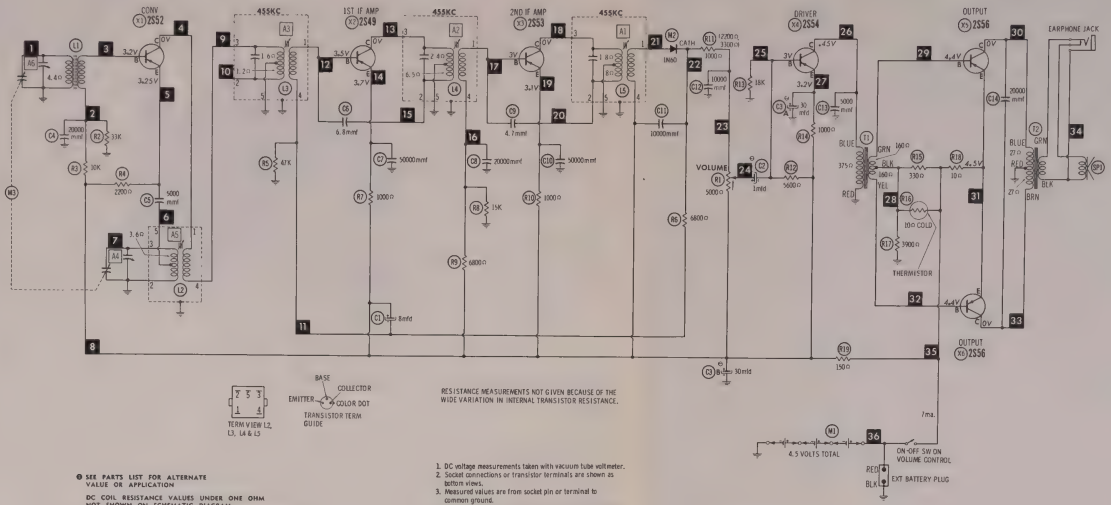
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

KF048



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

❶ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections or transistor terminals are shown as bottom views.
3. Measured values are from socket pin or terminal to common ground.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
© Howard W. Sams & Co., Inc. 1960

TOSHIBA
MODEL 6TP-354

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S52	Converter	2N412	2N486	2N412	PNP
X2	2S49	1st IF Amplifier	2N410	2N483	2N410	PNP
X3	2S53	2nd IF Amplifier	2N410	2N483	2N410	PNP
X4	2S54	Driver	2N408	2N362	2N408	PNP
X5	2S56	Output	2N408	2N632	2N408	PNP ⌝Matched
X6	2S56	Output	2N408	2N632	2N408	PNP ⌟ Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	TOSHIBA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	8	5	30515	XPP10001	NLW10-6	TT6X8			Note 1
C2	1	10			NLW1-50	TT12X1			Note 2
C3A	30	5							Note 2
B	30	5							

Note 1. Some versions may use 1mfd@3V in this application (Part #30488).
Note 2. Some versions may use 60mfd@5V in this application (Part #30516).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C5	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C6	6.8		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C7	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50
C8	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20
C9	4.7		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C10	50000		C80V503AM	DDA-503	H-05S5		TA-150	TG-S50
C11	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C12	10000		C80V103AM	DDM-103	H-05S1		TA-110	TG-S10
C13	5000		C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C14	20000		C80V203AM	DDM-203	H-05S2		TA-120	TG-S20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TOSHIBA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/4	40573	B16-214				Volume & Switch

RESISTORS (IRC or EQUIVALENT)

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	10K	
R4	2200Ω	
R5	47K	
R6	6800Ω	
R7	10000Ω	

ITEM No.	RATING	REMARKS
R8	15K	
R9	6800Ω	
R10	10000Ω	
R11	10000Ω	(2200Ω, 3300Ω) *
R12	5600Ω	
R13	18K	

ITEM No.	RATING	REMARKS
R14	1000Ω	
R15	330Ω	
R16	10Ω Cold	Pt. #40250
R17	3900Ω	
R18	10Ω	
R19	150Ω	

* Alternate Value.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		TOSHIBA PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Stancor PART No.	
L1	Loopstick	20377					
L2	Osc. Coil	20378					
L3	1st IF Trans.	20379					
L4	2nd IF Trans.	20380					
L5	3rd IF Trans.	20381					

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.2	1	20382					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TOSHIBA PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	650Ω CT	8-10Ω	20383						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TOSHIBA PART No.	QUAM PART No.	
SP1	2"	PM	8-10Ω	50114 (SP-2001A)		

BATTERIES

ITEM No.	VOLTAGE	TOSHIBA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	UM-5 *		N *		904 * E-401 ♦		RM-401 *	* 3 Required ♦ Mercury, 3 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		TOSHIBA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60		1N60	1N60	Detector (Pigtail)

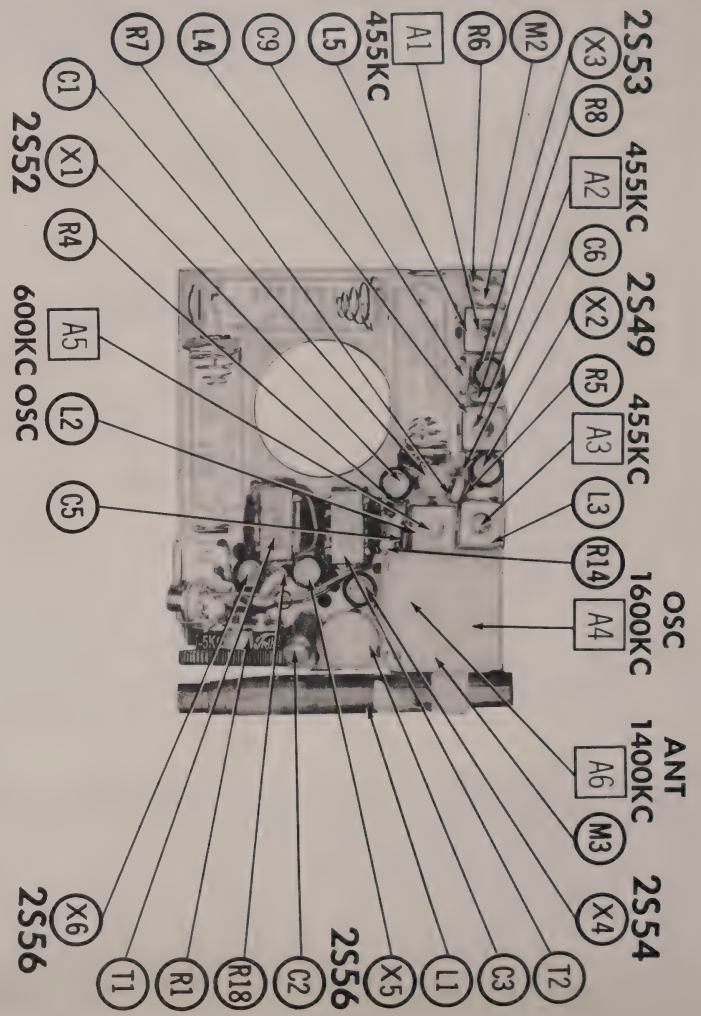
MISCELLANEOUS

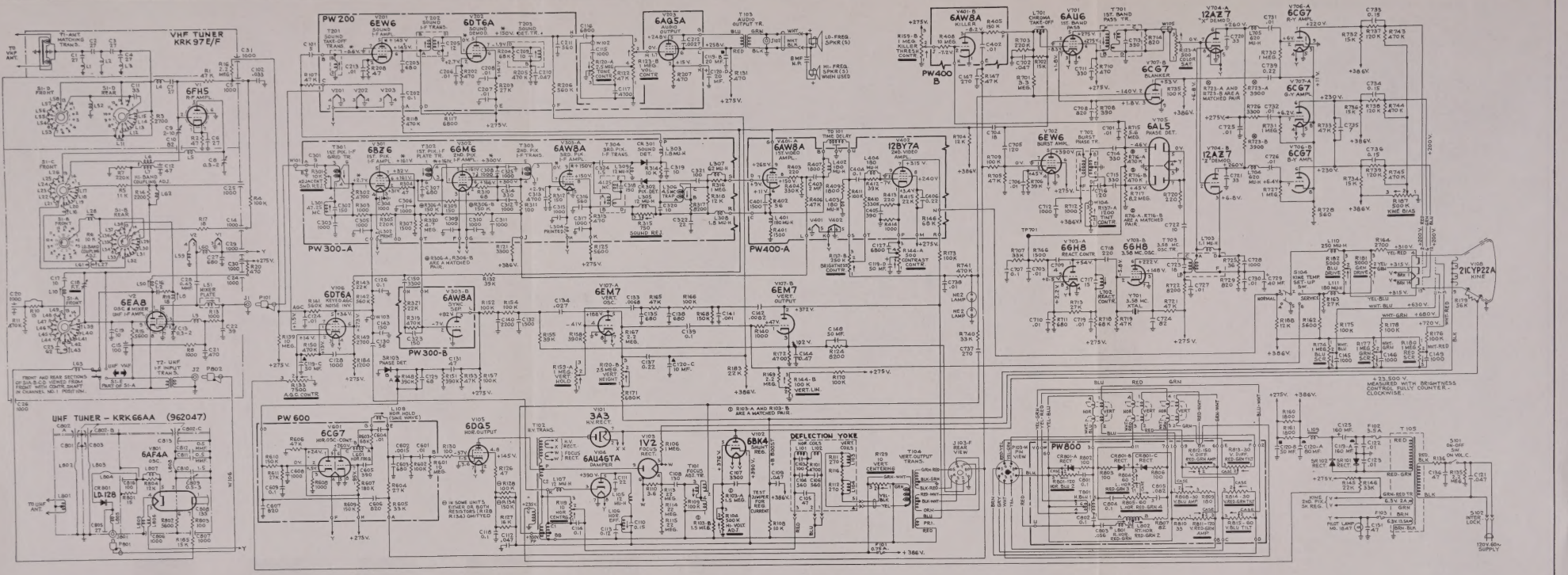
ITEM No.	PART NAME	TOSHIBA PART No.	NOTES
M3	Tuning Gang Printed Board	30522 60354	2 Gang

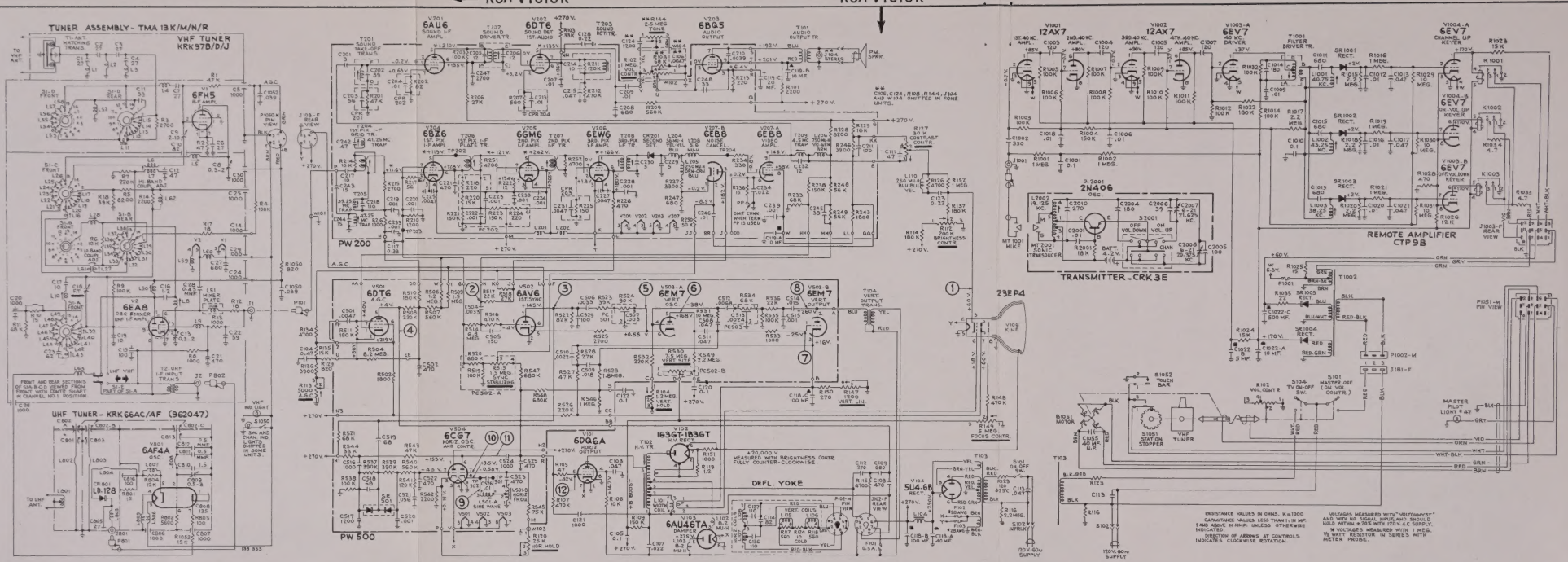
WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW




VHF TUNER KRK97E/F
UHF TUNER - KRK66AA (962047)
PW200
PW300-A
PW300-B
PW400
PW400-A
PW600
PW800
6EW6
6DT6A
6AG5A
6AW8A
6BZ6
6GM6
6EA8
6FH5
6DT6A
6EM7
6EM7
6BK4
3A3
1V2
6U4GTA
6DQ5
6AU6
6CG7
6EW6
6AL5
12AZ7
6CG7
6CG7
6H8
6H8
21CYP22A
12BY7A
6AW8A
6AW8A
6AW8



The schematic is shown in the latest condition at the time of printing.

All resistance value in ohms. K = 1000.

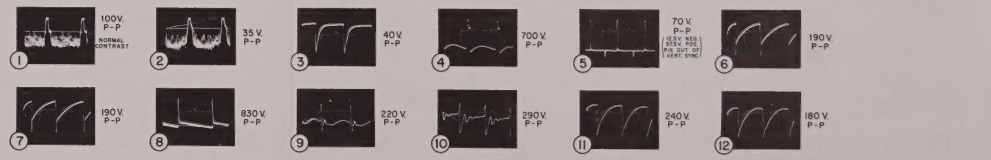
All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 120 v. a-c supply.

*Measured with 1 megohm, ½ watt resistor in series with meter probe.

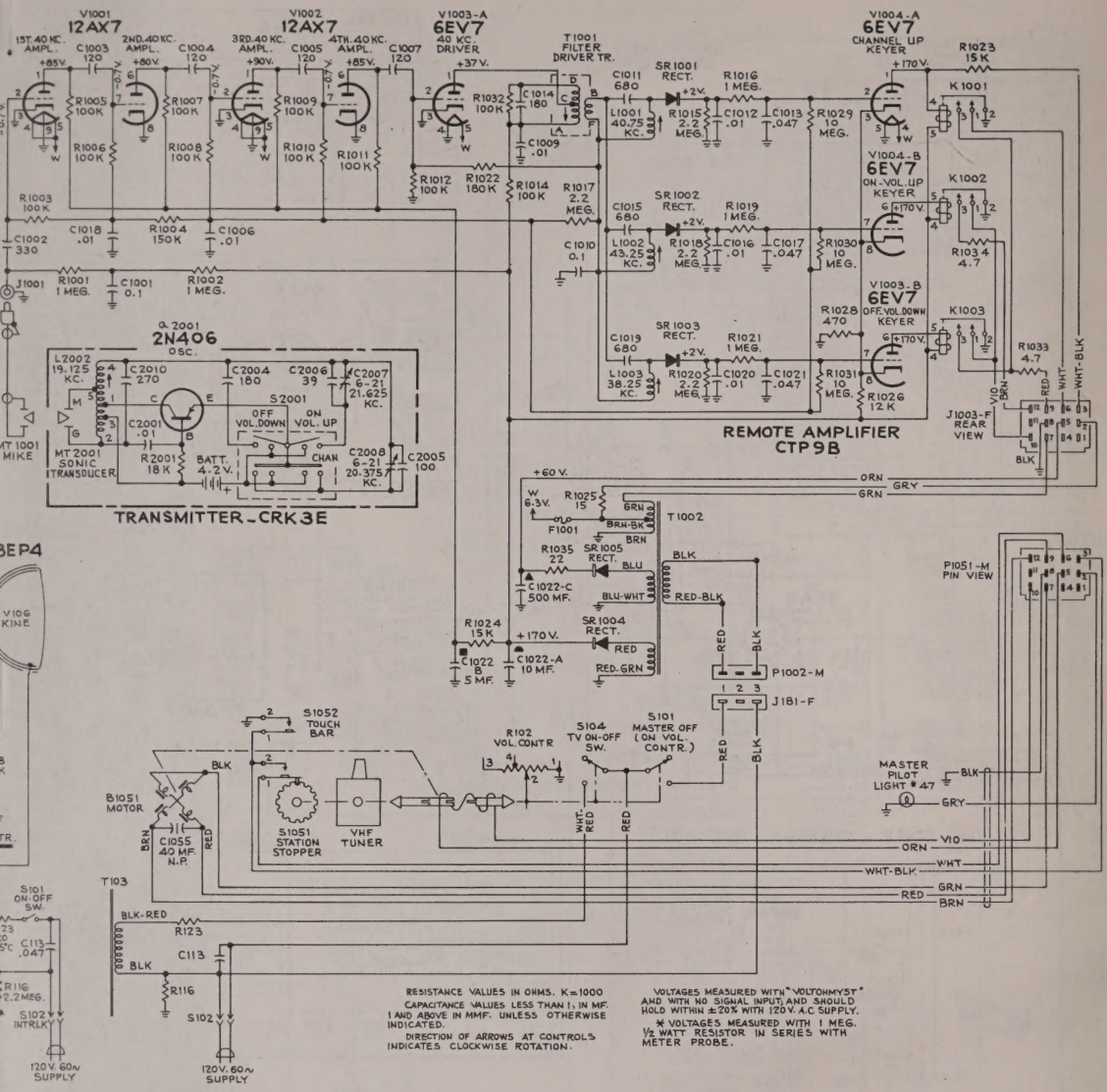
Balloons ①② etc., shown on schematic indicate points of observation of the waveforms shown below the schematic.



RCA VICTOR MODELS 231D66C4, U, 231D66N6, U, 231D635, SU, U, 636, SU, U, 637, SU, U, 231D655, SU, U, 656, SU, U, 657, SU, U, 659, SU, U, 231D665, U, 666, U, 669, U, 231D694, U, 695, SU, U, 696, SU, U, 231D716, U, 719, U, 231D R655, 656, 657, 231D R665, 666, 231D R695, 696, 231D R716, 719 (CH. KCS 132AA, AC, AD, K, L, M, N, R, T, W, ZA, ZC, ZD, ZE, ZF)

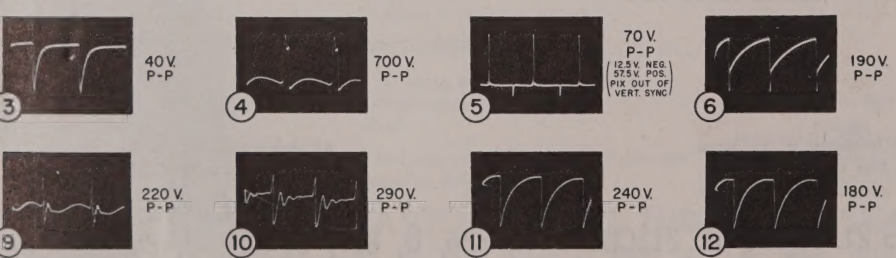
Schematic Diagram Courtesy of Radio Corporation of America

©Howard W. Sams & Co., Inc. 1960



RESISTANCE VALUES IN OHMS. K=1000
CAPACITANCE VALUES LESS THAN 1, IN MF. 1 AND ABOVE IN MMF. UNLESS OTHERWISE INDICATED.
DIRECTION OF ARROWS AT CONTROLS INDICATES CLOCKWISE ROTATION.

VOLTAGES MEASURED WITH "VOLTOHMYST" AND WITH NO SIGNAL INPUT, AND SHOULD HOLD WITHIN ±20% WITH 120 V. A.C SUPPLY.
* VOLTAGES MEASURED WITH 1 MEG. ½ WATT RESISTOR IN SERIES WITH METER PROBE.



Schematic Diagram Courtesy of Radio Corporation of America